BUTANE-PROPANE *News*

No. 1 JUNE 1939 25c

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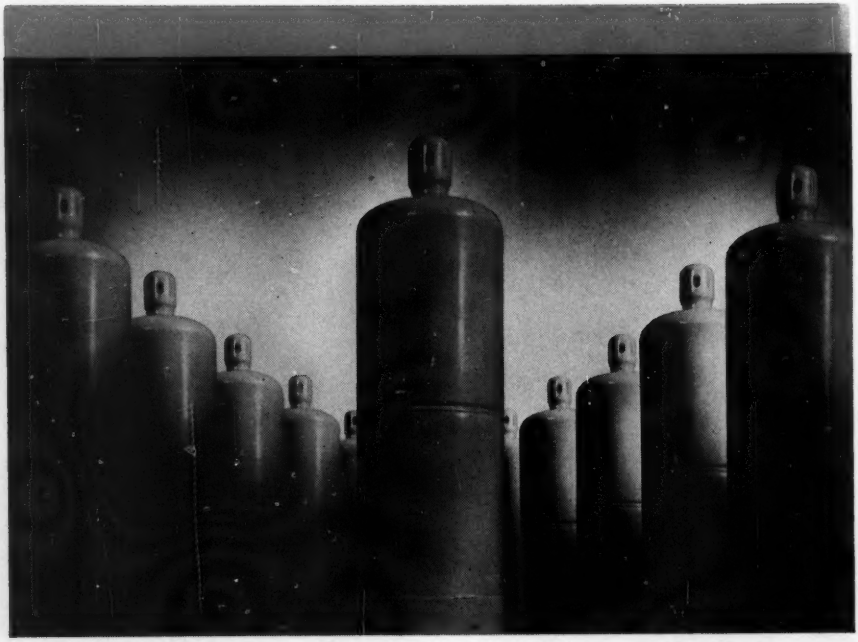

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Volume 1
Number 1

BUTANE-PROPANE *News*

JUNE
1939

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MAINLY BEYOND THE MAINS

GREETINGS

With this first issue of BUTANE-PROPANE *News* we are greeting many of our old friends through a new medium, and many new friends who, we hope, will become old friends.

If this were a new industry, or were this our first acquaintanceship with it, we would be strongly tempted to take considerable time explaining ourselves and our proposed policies. But, after better than 10 years close association with the liquefied petroleum gas industry in *G A S*, this new publication, devoted exclusively to that field, is for us a logical development in our efforts as publishers to give liquefied petroleum gas the editorial attention it has grown to merit.

Nothing gives us greater pleasure than to greet the industry as a grown-up sister in the national gas development. The other two branches—the natural and manufactured—are considerably older, and despite the claims of competitors to the contrary, are well-established as indispensible fuel services in modern American life in the territories they serve. However, economic necessity has limited piped gas service to the larger cities and convenient communities. Beyond their mains are millions of American homes, which were denied the advantages and benefits of clean, dependable and economical gas service, until about 20 years ago, when the industry as we know it today came into existence. Our pioneers, like the oft-quoted western governor, "seed their opportunity an' took it," as is well shown by the status of the liquefied petroleum gas industry today. Like all pioneers, those early "bottled" gas men faced a scoffing world. Happily, most of them have lived to prove they were right, and that the early satisfaction and appreciation of their first few-and-far-between customers were no flash in the pan.

We now know beyond a shadow of a doubt that the market is available, our gas service is salable, and the future is only limited by the degree of intelligence and effort we choose to apply in securing it.

SAFETY FIRST

And always, too, should be the underlying basic motto of this industry. It is deplorable that in many instances, its growth has been retarded in several localities due to sloppy installation practice in the field. In fact, it is more than deplorable, it is highly reprehensible because the welfare of people who have trusted the industry has been affected. There is really no excuse for it with the wealth of experience and research that has been expended on this subject during the 20 years of our existence. It is futile to plead ignorance or the inevitability of accidents. Alibis might explain, but they certainly do not condone avoidable mishaps. Every responsible distributor and retailer from the very beginning has recognized the paramount importance of safe installations and operation, and to their credit, they have never hesitated to spend freely of their money. time and effort to protect their customers and their industry to the limit. Since its inception, the Liquefied Petroleum Gas Association has made the study, formulation and application of safe practices the number one objective in its policies.

Many of the deplorable conditions that have arisen are due undoubtedly to the proverbial "bull-in-a-china-shop" tactics of overanxious newcomers in the business and with little else but enthusiasm to qualify them.

Again, as in all competitive businesses, it would be miraculous if we did not have our share of "chiselers," who cannot sell without a price advantage, and who, to gain this, skimp on the quality of their installation equipment and appliances, regardless of the possible disastrous consequences. Whether these men are merely ignorant of the economics of the business, or are callously indifferent to public welfare so long as they get theirs, is neither here nor there at this time. The fact that they exist within the industry—that their presence is a real menace—is the present problem. Its solution is obvious though not easy: The ignorant, providing they are sincere and intelligently interested in improving themselves, will react favorably to experience and education. On the other hand, if they are fly-by-nighters, wild-catters, or high-jackers, it becomes the duty of the ethical members of the industry to cooperate and by concerted action stamp them out. And the sooner the better.

BUTANE-PROPANE *News* recognizes its responsible toward this end and promises to pull no punches in helping to develop a proper appreciation of what is proper practice. Its editorial pages are open to all constructive material, designed to make better informed gas men of all who read it.

Welcome

J. WOODWARD MARTIN

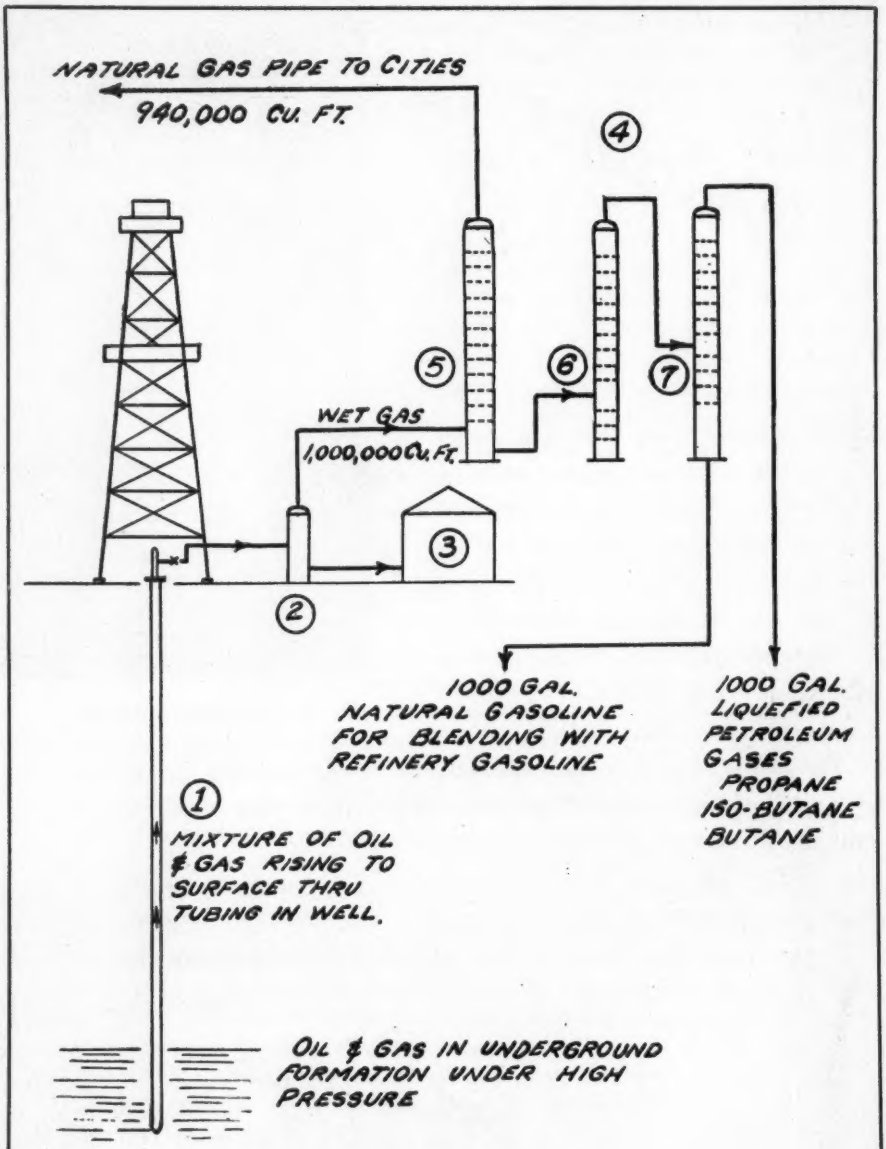
IN BEHALF of the Liquefied Petroleum Gas Association I wish to take this opportunity of expressing appreciation for the past service rendered to the industry by the publishers of BUTANE-PROPANE *News*. The BUTANE-PROPANE *News* Section of the old *Western Gas* Magazine and later *G A S* Magazine served the industry well.

The advent of this new magazine, BUTANE-PROPANE *News*, is typical of the growth of the industry it covers. The industry and many of its individual members have grown in stature and ability to serve, to the point where they now stand on their own feet and in their own right.

We congratulate BUTANE-PROPANE *News* on reaching its maturity and extend every best wish for its continued growth.

J. Woodward Martin

President,
Liquefied Petroleum Gas Association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5
6
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WET GAS
1,000,000 Cu. Ft.
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NATURAL GASOLINE
FOR BLENDING WITH
REFINERY GASOLINE
1000 GAL.
LIQUEFIED
PETROLEUM
GASES
PROPANE
ISO-BUTANE
BUTANE
1
MIXTURE OF OIL
& GAS RISING TO
SURFACE THRU
TUBING IN WELL.
OIL & GAS IN UNDERGROUND
FORMATION UNDER HIGH
PRESSURE

FIG. 1.

The ABC of LPG

Elementary Facts of Value to Every Dealer Offering Liquefied Petroleum Gas Service

THIS article is written to help inform the distributors, dealers, salesmen and users of liquefied petroleum gases who have not had an opportunity to become acquainted with the technical phases of some of the elementary facts pertaining to the methods of obtaining, handling and using these fuels.

To explain what these gases are, let us start at the source of supply. Fig. 1 shows (1) a producing oil well. A mixture of crude oil and wet gas flows from the underground reservoir to the surface through a pipe. At the surface this mixture is led into a gas trap (2). The gas trap is a separator where the crude oil comes off the bottom and is piped to storage (3). The wet gas comes off the top and is piped to the gasoline absorption plant (4). This wet gas contains natural gasoline, liquefied petroleum gases and natural gas. In this plant the gas goes through an absorber where the natural gasoline and liquefied petroleum gas are removed from the bottom and the dry gas or natural gas comes off the top and is piped to cities for use by the utilities.

The absorbing medium is piped to a still (6) where the combination of natural gasoline and liquefied petroleum gas is boiled off to form "wild gasoline" and the absorbing medium returns to the absorber.

This "wild gasoline" is then piped to stabilizer towers (7) where natural gasoline is removed from the bottom as the finished product and a mixture of liquefied petroleum gases is removed from the top. If desired, this top mixture can again be broken up into three parts, namely butane, iso-butane and propane, and stored separately.

Those in the industry are familiar with the various trade names of these liquefied petroleum gases and have an idea what butane, iso-butane and propane are. A person buying natural gas thinks of it as such. Actually, it is a mixture of methane and ethane. When one buys motor gasoline he purchases a mixture of butane, pentane, hexane, heptane, octane and maybe a half-dozen more such hydrocarbons.

Propane, iso-butane and butane fit in just between natural gas and gasoline. They are like natural gas in odor and burning qualities. They are like gasoline inasmuch as they can be handled and measured in liquid form. They are adaptable to most of the uses of either of these trade products. These fuels or any mixtures of butane and propane comprise liquefied petroleum gas.

These three components are very similar to each other, the main difference between them being their boiling points and vapor pressures.* Butane boils at

*For complete characteristics refer to *Handbook Butane-Propane Gases*, Revised Second Edition.

32° F.; iso-butane, at 10° F.; propane, at — 40° F.

In other words you could carry an open bucket of butane around the same as gasoline if the outside temperature is below 32° F. For propane it must be 40° below zero before it will stay liquid without evaporating.

Every liquid has a vapor pressure which becomes greater with increase of temperature. Water is common and can be used as an example. If water is heated to 212° F., its vapor pressure increases to greater than atmosphere, and so it starts to boil. If it is held in a boiler and additional heat supplied, the pressure increases. The thermometer shown in Fig. 2 indicates the boiling points and vapor pressures of familiar products for comparison.*

Inflammability

Liquefied petroleum gases, like gasoline and natural gas, are both inflammable and explosive when mixed with the correct amount of air (see chart on page 39). Their usefulness is dependent upon these qualities. When handled in properly designed tanks and equipment, they are no more hazardous than gasoline. However, when carelessly handled they present a hazard equal to natural gas or gasoline.

Liquefied petroleum gases are stored, measured, and shipped by tank car, truck and cylinder in the liquid state, but must be utilized in the vapor state.

To change them from liquid to gas requires the addition of heat. For small installations the heat from the atmosphere or the ground is sufficient to vaporize the material in many instances.

*Liquefied petroleum gases, due to their low boiling points, absorb the necessary heat from the atmosphere, and their pressures increase as the temperatures rise.

The gas is removed from the tank through a valve and pressure regulator. The function of the pressure regulator is to reduce the pressure from tank pressure to the very low pressure required to operate appliances. Although the pressure on the tank may be 100 lbs. per sq. in., the pressure in the gas line to the house is only about 6 to 8 oz. per sq. in.

To safeguard the handling of liquefied petroleum gases, engineers and accident prevention men have formulated rules for safe handling. These rules are published in booklet form by the National Board of Fire Underwriters, and many states and communities are adopting them as law. The latest revision of these rules will be ready for printing shortly and notice will be given in BUTANE-PROPANE *News* when they are available.

The possibility of explosion of a liquefied petroleum gas tank or container is remote. Code containers are designed to withstand greater pressures than are generated from atmospheric temperature. They are provided with safety valves or other means of removing excess pressure in case of fire from outside sources. It is impossible for fire to get into a container as long as there in any pressure in the container. The gas will emit from the tank and burn as a torch. The only chance of explosion is when a correct air-gas mixture is contained in the tank. An empty tank, similar to an empty gasoline drum, that has been left with the valves open so air can be breathed in, presents a hazard if exposed to open flame. This is the reason for requiring valves to be closed on empty containers during shipment and handling.

The vapors from liquefied petroleum gases are heavier than air and tend to

settle in low points. In making installations this should be taken into consideration and bottom ventilation provided in basements if appliances are used there.

Liquefied petroleum gases are not poisonous. The effect produced by them is a form of intoxication similar to gasoline fumes. They are practically odorless and the trade-named products are artificially odorized.

They are excellent solvents of all petroleum and rubber products, and for that reason it is necessary to use pipe dope containing no mineral oils and rubber substitutes for hose and diaphragms. Due to their solvent action the ordinary grades of plumbing and pipe fitting are not satisfactory.

Heat Content Compared

The heat content of these gases is approximately three times greater than natural gas and six times as great as manufactured gas. Because of this, appliances and burners designed for use with other gases are not always so satisfactory, even though altered, as equipment designed for liquefied petroleum gas usage. Dealers and salesmen particularly should recognize the need to recommend and sell only appliances designed for these gases if economy and satisfaction is to be obtained by the user. There are many makes of properly designed appliances available, and there is no need for marketing inferior products.

Liquefied petroleum gases can be pumped and metered in the liquid stage like gasoline. These gases can also be metered in gaseous form by standard gas meters equipped with special diaphragms and gaskets to prevent drying

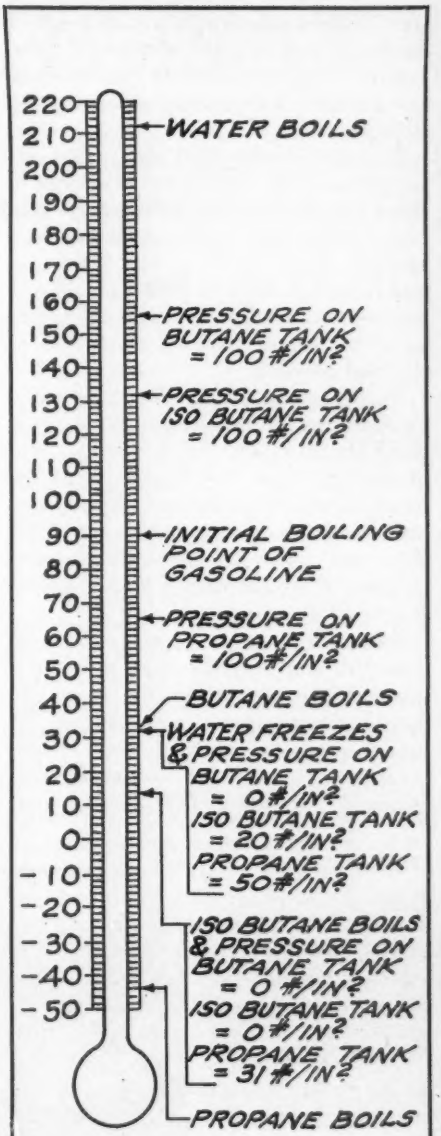


FIG. 2.

out. These gases can be pre-mixed with air to provide standby service for natural gas systems. There are many small communities using these gases through piped systems.

In some cases, undiluted gases are piped direct to the consumer. Some of these plants supply 2550 B.t.u. gas and some 3000 B.t.u. There are also air-mix systems. Some serve a 550 B.t.u. gas and others as high as 950 B.t.u. Manufacturers of appliances can usually furnish the proper burners if advised of the heat content.

Tank gas and semi-bulk units located on the users' premises furnish gas from 2550 B.t.u. to 3200 B.t.u. per cu. ft., depending upon the location and the source of supply of the fuel. Appliances built and tested to operate on 3200 B.t.u. gas can be satisfactorily adjusted to operate on gas with a heat value as low as 2550.

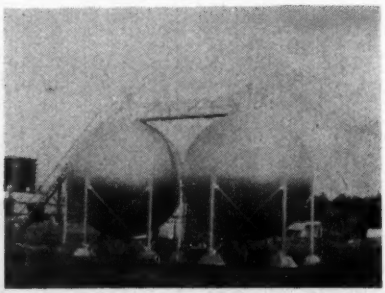
The octane value of these fuels is over 100 and they are supplied to the internal combustion engine as a gas fuel by using some of the heat from the jacket water to vaporize them. However, special tanks and carburetors are required for successful usage. Fuel consumption in gallons is approximately the same as gasoline. There are several makes of carburetors manufactured and sold for this purpose. These have been accepted and used successfully by the operators of truck fleets and automotive farm and construction equipment.

These gases can also be used in place of acetylene for cutting, brazing, preheating, and metallizing, but are not satisfactory for welding. Equipment for these types of utilization is available on the market.

Properly designed equipment and appliances are available and are as important to this industry as to any other.

When considering bulk handling or commercial installations, the operator should avail himself of the experience of competent engineering counsel.

In conclusion it can be stated that liquefied petroleum gas is an all-purpose fuel capable of fulfilling with satisfaction a wide variety of utilizations. Its economy has been proved by the manner in which it can successfully withstand the competition of electricity and other fuels.



Hortonspheres for storage of liquefied petroleum gases.

One Penny's Worth

A Comparative Analysis of Heating Costs: By Electricity and By Liquefied Petroleum Gas

By H. G. LAUB,
Southern California Gas Company

IT WOULD seem that any sales effort, to be successful, must be underlaid with basic knowledge of the product considered, and its merits compared with those of its competitors. The purpose of this article is to outline such a comparison between liquefied petroleum gases and electricity, indicating the economy that can generally be effected by using these gases instead of electricity.

The butane man must learn the most fundamental lesson of salesmanship—to sell quality. Gas, whether it is manufactured, natural or butane, has so many inherent qualities that are infinitely superior to competition that even if gas were more expensive, it would still be demanded by the purchasing public.

Only a casual inspection of the merits of gas is necessary to prove its superiority over its nearest competitor —electricity. Touching on only a few of the many comparisons that can be made between gas and electricity, the following are mentioned:

1. Gas has an immediate and infinite range of temperature for all uses compared with the usual slow and limited, low, medium and high speeds of the average electric range. Even the most ultra-modern electric range has only five speeds. Uniformity of temperature, particularly in ovens, is lacking in electricity, limiting usable space, while gas appliances are just the reverse.

2. Replacement of worn-out parts on gas ranges is negligible, and efficiency does not diminish with use, while on electric ranges just the reverse is true. Elements decrease in efficiency rapidly and frequently burn out, involving considerable maintenance expense.

3. The gas flame is turned on and off immediately, which means not only time saved but eliminates waste heat for the kitchen atmosphere to absorb. On the other hand, electricity requires preheating of intermediary wires, metals and refractory surfaces before use begins, and likewise cooling after use stops, all of which requires time and results in waste heat that must be absorbed by the kitchen atmosphere.

4. Special utensils are not necessary with gas, but for electricity considerable care must be exercised in choosing the correct type of utensil if efficiency is to be maintained.

5. Spill-overs are easily cleaned from

TABLE NO. 1. MINUTES OF HEAT THAT ONE CENT WILL BUY

Gas Burners—$0.05 per lb.			Electric—$0.04 per kwh.			
Type	*B.t.u.*	*Minutes for 1 cent*	*Type*	*Watts*	*B.t.u.*	*Minutes for 1 cent*
Small simmer	1800	147	Small, low	250	853	60
Medium simmer	2000	132	Small, med.	500	1706	30
Large simmer	2500	106	Small, high	1000	3412	15
Small top burner	9000	29	Large, low	500	853	30
Medium top burner	11,000	24	Large, med.	1000	1706	15
Giant top burner	14,000	19	Large, high	2000	6824	8

gas ranges without distressing odors, while the electric elements catch these, which either short out the elements or must remain to smell until the spillage is charred and the burner lifted and cleaned.

Many more advantages could be listed, space permitting, but since it appears that the "economy" point of view needs attention, a few simple arithmetical procedures are suggested, permitting the butane man to analyze his own case and by working out his own problem he should be able to remove a common fear.

For ranges, all burners are rated, gas in B.t.u. per hour, and electricity at watts per hour at each speed. Electric rates are usually so written that range consumption falls in the first block price following that allocated for lighting. Therefore, it is safe to use this price for comparative purposes. Table No. 1 shows how long various kinds of burners can be burned for one cent.

Table No. 1 is self-explanatory, but it is significant to note the amount of heat furnished by each type burner as well as considering the burning time for one cent.

In the water heating field, the proper sizing of a heater to fit the demand is essential to insure satisfactory service. Here the gas heater is supreme. The storage capacities recommended for each type service are compared in the following figures because they point to an inherent weakness in electric heaters.

	1 Bath (Tank Capacity, Gallons)		*2 Baths (Tank Capacity, Gallons)*	
Bedrooms	*Gas*	*Electric*	*Gas*	*Electric*
1	20	30	35	50
2	25	40	40	60
3	30	50	40	75
4	35	65	45	90

When considering the above table, remember, increased storage capacity results in increased initial costs and that the life of a heater depends primarily upon three conditions:

1. The chemical analysis of the water. Lime will be precipitated whenever water is heated above the liming temperature regardless of the source of heat.
2. Volume of water handled by the heater over a given period.
3. The care the heater receives.

Electric heaters usually specified are

the two-element type, and all heat passing into the water must pass through these relatively small surfaces. In the gas heater, the heat passes into the water through the sides and bottom, and in many heaters through tubes similar to a boiler. The heat transfer surface of an average gas heater is 40 times greater than that of the electric. Since low temperatures are essential to minimized liming or to render acid constituents in the water less active, large transfer surfaces are desirable. Hot spots, such as occur immediately surrounding the electrical element, cause liming action to take place at an accelerated rate. Therefore, in an attempt to supply adequate water with a reasonably competitive life for the heater, the size of the electric heater is increased and the heat input (recovery capacity) is limited.

In the acquisition order for electrical appliances, the water heater is almost always last, therefore for cost comparisons the electrical cost per kwh. comes in a lower block on the rate schedule. When making a comparative cost study, the following simple method is suggested. First, take these facts and assumptions:

1. Efficiency of a gas heater is 75 per cent.
2. Efficiency of an electric heater is 100 per cent (actually it will be between 85 and 95 per cent).
3. Temperature rise for water is 80° F.
4. One B.t.u. will raise 1 lb. of water 1° F.
5. One gal. of water weighs 8.33 lbs.
6. One kwh. equals 3412 B.t.u.
7. One lb. butane equals 22,000 B.t.u.

The net heat needed to raise 1 gal. of water 80° F. will be

$$1 \times 8.33 \times 80 = 666.4 \text{ B.t.u.}$$

Electric

$$\frac{666.4}{3412} = 0.2 \text{ kwh.}$$

Gas

$$\frac{666.4}{22{,}000} = 0.0303 \text{ lbs.}$$

Total heat needed:

Electric @ 100% efficiency = 0.2 kwh. kwh.

Gas @ 75% efficiency = $\frac{0.0303}{.75} = 0.0404$ lbs.

Ratio of cost with electricity @ $0.02 per kwh., and gas @ $0.05 per lb.:

0.2×2 cents = .4 cents.

$.0404 \times 5$ cents = .2020 cents, or $\frac{.4}{.202} = 1.98$,

which means that electricity costs approximately twice as much as gas.

When it is desired to compare the entire domestic field, the consumption figures published by the electrical industry can be used as a basis for comparison. The A.G.A. Testing Labora-

TABLE NO. 2

	1	2	3	4	5	6	7	8
Lights and miscellaneous	elect.	elect.	elect.	elect.	elect.	elect.	elect.	elect.
Cooking	gas	elect.	elect.	gas	gas	elect.	elect.	gas
Refrigeration	gas	elect.	gas	gas	elect.	gas	elect.	elect.
Water heating	gas	elect.	elect.	elect.	gas	gas	gas	elect.

tory has determined gas equivalents for 1 kwh. used for domestic purposes as follows:

0.342 lbs. butane = 1 kwh. for cooking.
0.306 lbs. butane = 1 kwh. for water heating.
0.744 lbs. butane = 1 kwh. for refrigeration.

The published figures of the electrical industry reveal the average consumption in kwh. for domestic appliances. By multiplying the electrical average by the A.G.A. gas equivalent, the corresponding average gas consumption is determined, as shown by the following figures:

	Electricity (Kwh.)	*Gas (lbs.)*
Lights and small appliances	35	0
Cooking	165 × 0.342 =	56.4
Refrigeration	65 × 0.744 =	48.4
Water heating	321 × 0.306 =	98.2

Combinations of use can be classified into eight groups, as shown in Table No. 2.

For purposes of illustration the following rate schedules are assumed as typical:

Gas

First	50 lbs. @ .06	per lb.
Next	50 lbs. @ .045	per lb.
All over	100 lbs. @ .03	per lb.

Electric

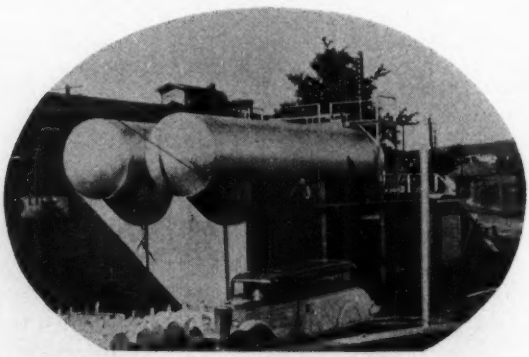
First	30 kwh. @ .0675	per kwh.
Next	120 kwh. @ .045	per kwh.
Next	350 kwh. @ .020	per kwh.
Next	1500 kwh. @ .018	per kwh.

The total utility bill for each group above would then be as follows:

Group	*Electric Bill*	*Gas Bill*	*Total Bill*
1	$ 2.25	$8.34	$10.59
2	15.97	0	15.97
3	14.80	2.90	17.70
4	11.43	5.39	16.82
5	5.18	6.89	12.07
6	8.43	6.65	15.08
7	9.73	5.17	14.90
8	12.85	3.29	16.14

From the above it seems that gas serves the customer in the most economical manner when the overall picture is considered. If the butane man will analyze his own field, he should be able to dispel all his fears, devoting his sales efforts to quality selling.

In this article only a few points have been covered. There is a world of material in the gas association's literature available to those who will study.



Bulk Station, East Penn Gas Company, Lewiston, Pa.

George G. Oberfell Given Hanlon Award By National Gasoline Association

AT THE May convention of the Natural Gasoline Association of America in Tulsa, Okla., George G. Oberfell, vice-president in charge of research and of the Philgas Department of the Phillips Petroleum Co., was presented with the Hanlon Award. The award, sponsored by the Association, and presented annually in recognition of distinctive services in advancing the interests, standards or technical procedures of the natural gasoline industry, has now been opened also to those engaged in the liquefied petroleum gas field. The award consists of an engraved, solid gold watch and chain and the engraving of the recipient's name upon a bronze plaque which hangs permanently in the office of the Association. The presentation was made by J. A. LaFortune, outgoing president of the N. G.A.A.

Previous recipients of the Hanlon Award have been J. W. Cowles, Shell Petroleum Corp., 1938, and R. C. Alden, Phillips Petroleum Co., 1937.

The donor of the Award is E. I. Hanlon, chairman of the Board of the National Bank of Tulsa and of the Hanlon Companies, a pioneer in the natural gasoline industry.

Specifically, the bases upon which the Hanlon Award is made include:

"Research of any kind tending to create a broader use of natural gasoline or liquefied petroleum products.

"Manufacturing processes or equipment which would permit greater yield or more economical operation.

"Test methods and procedure, creation of standards, delineation of specifications or advancement in laboratory technique.

"Handling, storage or transportation of natural gasoline.

"Marketing, gas contracting, accounting, public or industrial relations, safety developments, or any business phase of the natural gasoline industry."

Each nomination for the honor must be accompanied by a citation of service and reasons why the name is submitted, and may be made voluntarily by anyone sufficiently interested to do so.

Mr. Oberfell is one of the pioneers of the liquefied petroleum gas industry.

George G. Oberfell (left) receiving the Hanlon Award from J. A. LaFortune at the N.G.A.A. Convention at Tulsa, Okla., May 4.

Appliance

By W. R. TELLER

Research Engineer,
A.G.A. Testing Laboratories

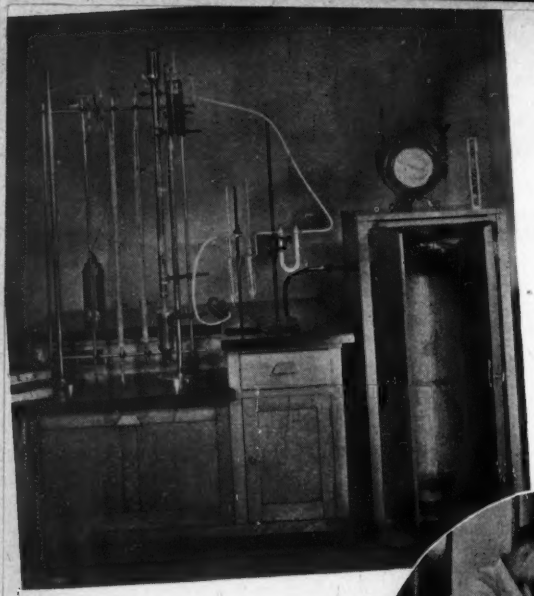


FIG. 1. Fractional distillation apparatus for analyzing liquefied petroleum gases, with special portable cabinet and meter equipment for such gases.

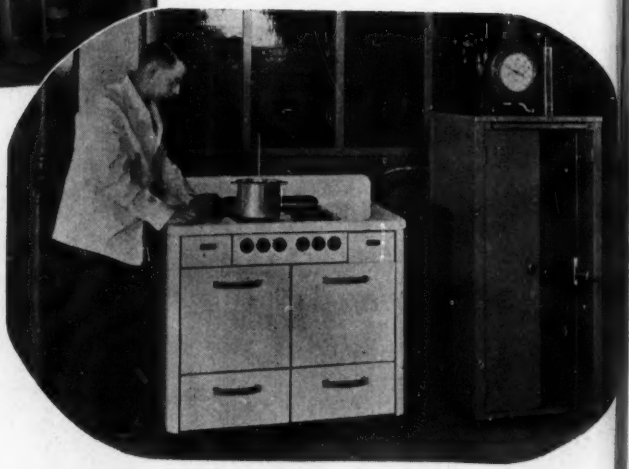


FIG. 2 (at right): Determining top burner thermal efficiency of range utilizing liquefied petroleum gas.

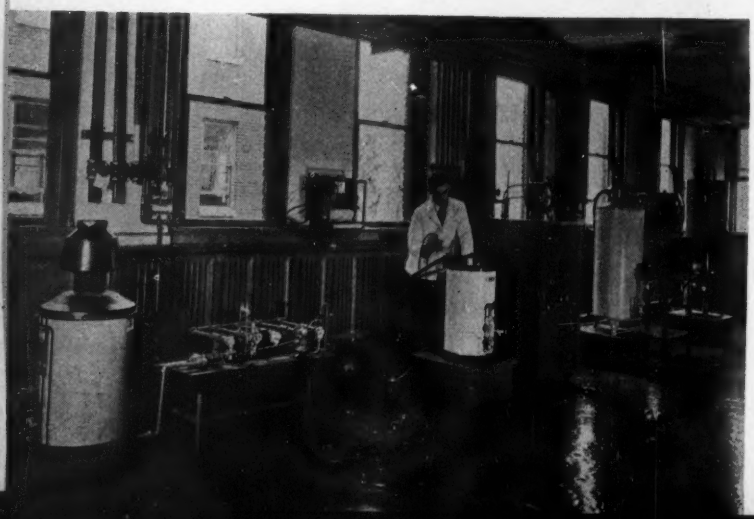


FIG. 3. Sampling flue gases from water heater operating on liquefied petroleum gas.

Testing

How the American Gas Association Testing Laboratories Benefit the L. P. G. Industry

IN 1932 the American Gas Association, through its Approval Requirements Committee, first prepared standards covering the construction and performance of common types of domestic appliances for use on propane and butane-air gases. This constituted an extension of the nationally known gas appliance testing and certification program inaugurated by the Association in 1925. Since that time, the entire gas industry as well as the public has increasingly recognized the importance and value of approved appliances, the former as a useful tool in extending and improving its service and the latter as a means of obtaining, as well as guaranteeing, safe and efficient equipment for utilizing gaseous fuels.

National Recognition

The national recognition accorded to the approval requirements of the American Gas Association is undoubtedly a result of the careful procedure originally evolved for their development. The keystone of this procedure was the plan of selection of committee personnel broadly representative of all interests involved rather than to limit it to technical, merchandising, or other groups of more or less special interests. As an example, the A.G.A. Approval Requirements Committee, which is also a Sectional Committee of the American Standards Association, is composed of representatives not only of the gas industry but also of various governmental and other organizations. Included among such general interest groups are the National Bureau of Standards, U. S. Public Health Service, U. S. Bureau of Home Economics, National Safety Council, American Institute of Architects, Associated Factory Mutual Fire Insurance Companies, and other organizations. Wide representation of various interests both within and without the gas industry is thus obtained. All standards finally adopted by this committee are then presented for approval to the American Standards Association. Upon its acceptance they are printed as American Standards, their significance as a result being greatly enhanced.

Subcommittee Work

Under the supervision of this general committee are a number of subcommittees, each of which is responsible for the preparation of requirements for a particular type of appliance or accessory, and their periodic revision as the progress of the art demands. The work of these subcommittees is

subjected to review not only of the Approval Requirements Committee but also through regularly organized procedure by the industry as a whole. An important aspect of the development and revision of requirements is the continuous program of research conducted solely for the purpose of providing interested requirements committees with technical data which they require. This investigational work, in recent years, has been carried on entirely at the American Gas Association's Testing Laboratories. Results of the program are made available only to the committees involved and are an important factor in insuring preparation and final adoption of requirements which are technically sound as well as equitable to all interests concerned.

Standards for Appliances

Standards for appliances for use with liquefied petroleum gases are an integral part of the corresponding requirements for city gas appliances. For example, the Approval Requirements for Domestic Gas Ranges include sections covering requirements for liquefied petroleum gases and butane-air gas as well as for natural and manufactured gases. Furthermore, requirements subcommittees have representation from both the Compressed Gas Manufacturers' Association and the Liquefied Petroleum Gas Association to insure adequate recognition of problems and conditions peculiar to liquefied petroleum gas utilization. Many of the requirements research problems conducted by the American Gas Association's Testing Laboratories are directly concerned with the performance of appliances using the liquefied fied petroleum gases. As a result of the factual data obtained from these studies, the resultant requirements are, it is believed, consistent with the physical properties of liquefied petroleum gases as related to appliance performance just as the adequacy of committee personnel insures appropriate consideration of the economic and engineering aspects of liquefied petroleum gas utilization. As a consequence, the approval requirements are considered as being as authoritative and comprehensive in the liquefied petroleum gas field as they are for appliances utilizing city gases.

Obviously, the mere existence of standards, regardless of their merit, could have little significance either to the industry or the public if the equipment which they were developed to cover did not comply with them. Furthermore, granting that the appliances did comply with the applicable standards, little importance would be attached to such compliance unless it had been determined and certified by a well-known and competent organization. Thus, to complement the Association's requirements, it was foreseen that it would be necessary first to establish a qualified testing agency to

W. A. TELLER, Research Engineer, A.G.A. Testing Laboratories

determine compliance with the requirements, and second, to certify the appliance as having complied with them. These functions have been delegated to the Association's Testing Laboratories. The main Laboratory in Cleveland is the largest and most completely equipped appliance testing laboratory in the world and serves all manufacturers east of the Rocky Mountains. A branch in Los Angeles is available to West Coast manufacturers and is also completely equipped to apply each of the hundreds of tests embodied in the various requirements. As will be noted from accompanying photographs, special arrangements have been made to facilitate testing of appliances for use on liquefied petroleum gases.

In examining appliances for approval the Testing Laboratories impose only those tests prescribed in the requirements. In the event a particular appliance complies with all applicable specifications, approval is granted on it, whereas approval is necessarily withheld if it fails to do so. Appliances which are approved are required to bear a permanent facsimile of the Laboratories' Approval Seal which is a trade-marked emblem. Further, official recognition of its certification is afforded by including the number and trade name of the appliance under its manufacturer's name in the Testing Laboratories' periodical publication entitled "Directory of Approved Gas Appliances and Listed Accessories." This Directory is published quarterly, supplements which record additional approvals being issued during the intervening months. It contains separate sections for the various types of appliances which have been approved for use on liquefied petroleum gases, propane, or butane-air gas. Currently, some 8000 appliances are listed in the Directory, representing the products of around 350 manufacturers. About 25 per cent of these have available equipment approved for use on liquefied petroleum gases.

Inspection System

While it is practical to test only one model of a particular make and type of appliance, an inspection system is maintained which serves to insure conformance of all approved models constructed by the manufacturer. Complete descriptions are made of every appliance tested, and during factory inspections by the Testing Laboratories' engineers, current production models are compared with these descriptions. It is required that complete agreement exist, and approval is continued only on condition of such conformity.

To appreciate fully the significance of the Association's testing and certification program, one has only to review a printed copy of the approval requirements for a particular appliance, noting the number and completeness of the specifications and realizing that an approved appliance complies

with each and every applicable specification. It is interesting to note, for example, that the Approval Requirements for Domestic Gas Ranges contain over 500 separate requirements. Safety is, of course, the primary objective of the approval program and safety of performance is covered in all of its conceivable aspects. For example, combustion tests demonstrate the ability of an appliance to burn gas completely; fire hazard tests, the ability to operate even under abnormal conditions without producing excessive temperatures of flue gases or on walls or floor; and burner operating tests, the ability to operate without flash-back or carbonizing flames. Most types of thermostatically-controlled appliances for use on liquefied petroleum gases are required to be equipped with automatic devices which will effectively operate (as shown by performance tests) to shut off all gas to the appliance in the event the pilot flame is extinguished. Economical operation of approved appliances is insured by suitable thermal efficiency requirements, while substantiality and durability receive considerable attention, both by specifications covering constructional details and by actual performance tests. Convenience in use and ease of servicing constitute objectives of other major items embodied in all of these requirements.

Until recently no approved appliances were available for operation on liquefied petroleum gases with the exception of those specifically approved for use on propane and butane-air. However, in the last few years, an increasingly greater demand had been experienced for extending the existing requirements to include butane gas, and accordingly steps were taken to augment the requirements in this direction. At the request of several requirements committees, a thorough investigation of the performance of appliances on various types of liquefied petroleum gases was undertaken at the A.G.A. Testing Laboratories. Results obtained indicated the feasibility of specifying the use only of butane gas during conduct of approval tests and the granting of approval, assuming satisfactory performance on butane was obtained, to the appliance for use on both propane and butane as well as any uniform mixture of the two. The amplification of the requirements to cover fully the liquefied petroleum gas field has been formally effected in the approval requirements for gas ranges and water heaters. Similar extension of the requirements for other equipment such as space heaters and refrigerators is now in progress.

Ranching De Luxe

An All-Purpose Fuel Tames the Wild West

By W. T. JOPLIN
Vice-President, Butane Corporation, Phoenix, Arizona

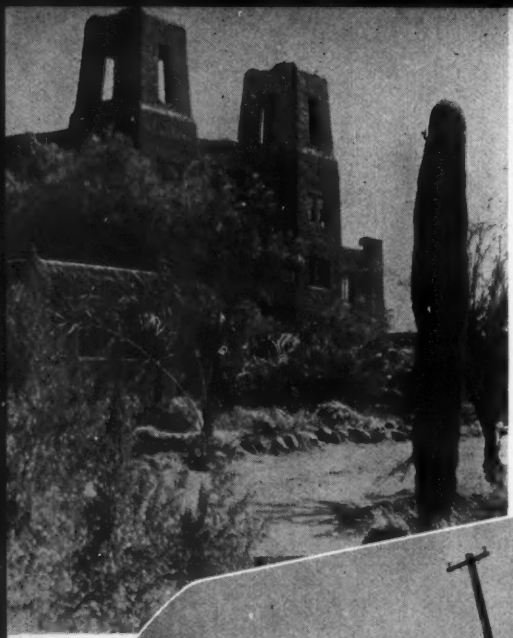
ARIZONA has its old-time cattle ranches, and real cowboys still ride the range. But today we also have a new type of ranch, where the care and well-being of the livestock is secondary to that of the guests, and the cattle are often kept only to provide atmosphere and background. The cowhands ride herd on visiting socialites in the daytime, and in the evening entertain them with cowboy ballads to the accompaniment of banjo and guitar.

Our state is dotted with these guest ranches. One of the principal factors in the growth of the industry has been the development of accommodations, which even in isolated localities compare favorably for comfort and service with first-class hotels in any city. The Easterner who goes "roughing it" at a guest ranch may really get a lot of out-of-door exercise during the day by taking long horseback rides, perhaps doing a little roping or even bulldogging, but when he comes in at night he wants a hot bath, good reading lights, heated rooms, a well-cooked meal, in fact all conveniences to be had in his city home.

Operators of such hostelries are more and more coming to realize that the modern answer to their problem is liquefied petroleum gas, one kind of which is butane. From one central installation may be furnished heat for rooms or cottages, fuel for cooking, power for pumping water, and generation of electricity.

Many of our old guest ranches have been entirely rebuilt since the introduction of butane into Arizona. They have renovated their kitchens, installed new heating and water heating systems, and in general improved the ranch to attract a higher type of visitor who is willing and happy to pay much higher prices for these added conveniences—and, what's more, have been able to operate in many instances for less than with their previous combinations of fuel which included wood, coal, oil, gasoline, and kerosene.

Take, for instance, Phil K. Lewis, owner and manager of the Sahuaro Lake Ranch, at the foot of rugged Stewart Mountain. Located some 50 miles from Phoenix, this beautiful ranch is reached by a good road, although not on any railway or main highway. Here we find butane in complete control of the situation. Every cottage is heated with gas steam radiators, an abundant supply of hot water is always on tap, and the old, expensive and wasteful coal range has been discarded for butane. Mr. Lewis has been using complete butane service for over two years and not a single service call has been made except for possibly some minor adjustment made by the driver of the truck when making bu-



The author, Mr. W. T. Joplin, vice-president, Butane Corp., Phoenix, Arizona.

AT LEFT: Main building of Jokake Inn, guest ranch near Phoenix, where butane is used for cooking, space heating and water heating.

ABOVE: Typical above-ground installation made by Butane Corp.

AT RIGHT: View from the veranda at Sahuaro Lake Ranch, Arizona.

tane deliveries. He says that it is a common occurrence for his guests to enter into a discussion regarding the merits of this all-purpose fuel as they assemble in the main lobby in the evenings. They marvel at the fact of gas energy being supplied at such a rugged and out of the way place. This is one of the big reasons why Sahuaro Lake Ranch is filled to capacity with a waiting list at $45 to $55 weekly per person, exclusive of saddle horses.

The Herman Winter property, near Mesa, Ariz., is an example of a ranch of a different type. Located in the citrus belt, it is under intensive cultivation. Were you so fortunate as to be Mr. Winter's guest for the night, you would find your room comfortably heated by butane, and lighted by power from a 5-10-15 K.W. Kohler plant, fueled by butane. For your ablutions you would use water pumped by this same plant. In the morning your breakfast would be cooked by butane, which would also furnish power to percolate your coffee and operate the electric refrigerator to freeze the ice. In short, every modern convenience at the Winter Ranch is provided through butane.

The famous Jokake Inn, situated 10 miles from Phoenix, is more of a resort hotel than a guest ranch. It is located at the foot of beautiful Camelback Mountain, and its guests amuse themselves with horseback riding, golf, swimming, tennis and other sports. Butane is used for cooking, for heating the main building, and heating water—even the water of the swimming pool, when necessary. Jokake Inn was designed and built in 1926 by Robert T. Evans, nationally known architect. A man of his type and with his vision wasn't long in recognizing the possibilities butane offered his venture, and his was the first resort hotel equipped for butane by the Butane Corp. of Phoenix. He used it one year on one of his cooking units and then put in larger storage and completely overhauled his place, installing the most modern of gas appliances.

These three typical installations are all similar, each having a 500-gal. storage tank, sufficient vaporization being furnished by the normal temperatures prevailing in this state without use of heat exchanger. In most instances where a complete service is installed, we employ primary regulation, reducing the pressure to about 10 lbs. at the tank, piping under the ground to the various buildings, where secondary regulation is used to reduce the pressure to 10 in. water column. Once the installation is made, our delivery truck calls at regular intervals to fill the tanks, and the customer is relieved of any bothersome details. He finds our service like that on regular gas mains.

Such ranches as are mentioned in this article cater to persons of higher incomes, and a flat rate is charged weekly or monthly which includes all services. On some of the smaller ranches the gas is metered to the different cottages and the meter read monthly. In other instances, coin meters are used.

I feel that butane has been an important factor in the development of the guest ranches of Arizona. The people who come here to enjoy the outdoor life and "go Western" for awhile are looking for sport and recreation, not hardship and discomfort. They are of a class who expect convenience and service. Butane makes it possible for ranches to offer these.

The simplicity with which a new bottle of liquefied petroleum gas can be substituted for an empty. Installation by Pyrofax Division, Carbide and Carbon Chemicals Corp., New York City.

Promotional Rates

A Successful Selling Method Which Benefits the Gas Consumer and Builds Additional Load

By WALTER A. NAUMER

Manager, Pyrofax Division, Carbide and Carbon Chemicals Corporation, New York

IT IS self-evident that the ultimate success of any liquefied petroleum gas supplier depends upon obtaining an adequate return from the capital investment. By far the greatest investment in our industry is in cylinders. Adequate cylinder turnover is, therefore, essential. Obviously building the individual consumer load goes hand in hand with efforts to improve cylinder turnover.

When devising methods for increasing the individual customer's consumption of gas, it is important that thorough consideration be given to the various things which must be guarded against. During the past few years "Promotional Rates" have been instituted by us as one method and have proven quite successful. A "Promotional Rate" must be so designed that it will not work a hardship on users who are unable to participate in the advantages offered by such a plan. It must be designed so that it will be impossible for anyone to enjoy the benefits which accrue without conforming to the plan in its entirety. I believe I will be able to make this point more clear in the further discussion of the plans we have adopted. Another important point to take into consideration is that a "Promotional Rate" should not be used to unduly influence customers to use more gas *merely because we want to sell gas.* In other words, the plan should first be designed with the customer's best interest in mind. Otherwise, if the customer is oversold, we may defeat our own purpose in subsequently discouraging the use of gas at all.

Until about six years ago, we did not expend a great deal of time or effort to promote the use of gas for water heating. Incidentally, it is interesting to note that neither did the suppliers of city gas encourage gas water heating much prior to six years ago. The reason for this was, of course, that the high rates then in existence made the use of gas prohibitive for this purpose. Coincident with the increase of our business, we were enabled to reduce materially a number of costs and we have consistently followed the policy of passing on these savings to our users by voluntary reductions in the gas price.

With the lowering of the rate for cooking, there developed a definite demand for even lower rates so that the user might enjoy the additional convenience of gas water heating. In

order to meet this demand the "Dual Usage Rate" was instituted by us. As a further inducement to use gas for water heating as well as cooking, this reduced rate was offered to customers. We require that the user agree to purchase a minimum of 600 lbs. annually, and use gas for cooking and *automatic* water heating. The justification for the lower rate is obvious. When the average customer, who uses gas only for cooking, adds an automatic water heater, he may be expected to at least double his consumption of gas. It is interesting to note that the average consumption of our dual usage customers is actually about 800 lbs. annually.

To qualify for this rate, we specify that the water heater installed by the customer must be automatic in operation. The reason for this is that a customer could install a cheap side-arm heater for a very nominal sum, and make limited use of it. Many customers of this type use the water heater only two or three times a month, and the increase in their gas consumption is very slight. The automatic water heater is, however, continuous in operation and requires some gas not only for the pilot but to maintain the water at a desired temperature. It does not depend entirely on the withdrawal of water for the consumption of some gas. The following description of how this "Dual Usage Rate" plan works out will serve to illustrate just how the customer benefits.

Assuming that a customer is using 400 lbs. of gas per year for cooking only and pays 12c per lb., his total cost for cooking alone is $48, or $4 per month. If this customer adds an automatic water heater for year-round usage, thereby increasing his yearly consumption to say 1000 lbs., he is enabled to enjoy a flat rate of 8½c per lb. for all gas used. His total yearly cost now becomes $85, or an increase of $37 over his former cost. His actual monthly increase in cost is only $3.08. In other words, he has secured all the benefits of year-round hot water and, although this has increased his annual gas consumption 150 per cent, it has cost him only $3.08 per month, or 75 per cent more than he formerly spent for cooking alone.

We use the above illustration in presenting the plan to the customer.

The "Dual Usage Rate" is available to customers who use gas for cooking and refrigeration in exactly the same manner. If the customer installs a Servel Electrolux in addition to a range, he obtains the benefit of this promotional rate. The results obtained through the use of this plan have been highly beneficial both to the customer and to our company.

At the present time we are testing this rate in one or two selected areas to see if it can be properly extended to include space heating. Our results to date are inconclusive on this, and do not enable us to judge its effectiveness.

The "Dual Usage Rate" is not specifically applicable to heavy duty cooking. It can be employed, of course, but generally the gas load for heavy duty cooking is sufficiently large to justify a special low commercial rate. We instructed flat rates based on the total yearly consumption, and these are usually lower than the domestic "Dual Usage Rate."

In order to make any promotional rate succeed, we must consider some means for encouraging the retail sales-

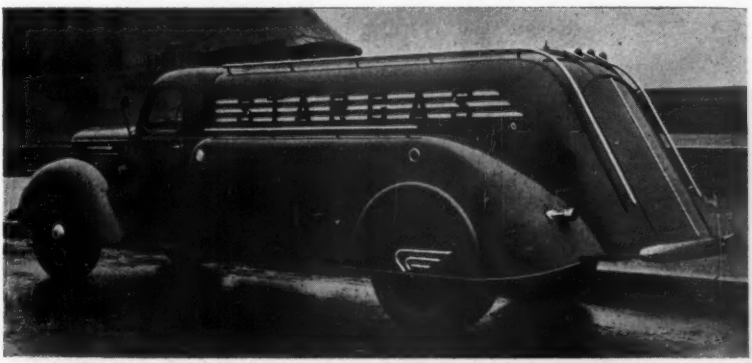
man, dealer or distributor to sell more load-building appliances. In order to do this, we institute monthly and quarterly contests whereby the salesman earns a cash prize or bonus in addition to the regular commission or appliance profit if he exceeds a predetermined quota.

In order that every distributor may have an opportunity to earn a bonus for load-building appliance sales, whether he is in the prize-winning class or not, we have what we call a "C.T.U." bonus plan. This plan follows:

We have found that a definite relationship exists between the type of appliance purchased and the consumption of the purchaser. The buyer of a good new stove will usually become a good gas user. On the other hand, "conversion" jobs or adaptions seldom require normal amounts of gas. Consequently, we have established quotas based upon the dollar volume of appliance sales and *not* upon the number of new users sold. We use what we term the "Cylinder Turnover Unit," or C.T.U., as a basis for figuring the bonus. One C.T.U. represents $25 in appliance sales. One dollar bonus is paid to distributors for each C.T.U. earned over the annual quota. Quarterly prizes are awarded to leaders.

The details of any similar plan must, of course, be varied to conform to the supplier's general sales policies and methods of marketing.

No such plan should ever be attempted until proper and prompt follow-up can be provided from the central office. Campaigns for salesmen should be based on short intervals of time, preferably quarterly, so that the participant does not have to wait an unreasonable length of time in order to benefit. Above all, the cardinal idea in any effort to build individual consumer gas loads should be to adopt an equitable program and see that it is carried out in every detail unremittingly every day in the year. The answer to this problem may well be expressed in the words, "Keeping everlastingly at it."



Completely enclosed, streamlined butane tank truck, operated by Dallas Gas Company, and built by Columbian Steel Tank Company, Kansas City.

Why I Hired A Home Service

IN 1936 I first organized the Holicer Gas Co., Inc., of Mansfield, La., and started into the butane gas business. After being in the business for a year or so I found that the majority of our customers in the rural sections were people who had never before used gas of any kind for fuel, and that we were having a number of complaints on the way our equipment was operating, especially our cook stoves. The housewives would burn their bread on the bottom; it would not brown on top, and various other complaints of this nature were made. This caused the service men to make many calls for readjustment, when the real trouble was that the customer did not understand the use of gas equipment.

Miss Janie Byrd found that home service demonstrating and building goodwill for the Holicer Gas Co. brought her golden opportunities for direct sales—and many an appliance she sold!

In 1938 I decided to hire a full-time home demonstrator to hold meetings with different clubs and put on cooking demonstrations throughout the entire territory to educate our customers who had never before used gas on the operation of equipment and to show them how to make adjustments themselves. After every new installation we would have our home service expert call on the new customer and spend some time with her, help cook a meal and go into details on the operation of our stoves. We have found that this is very satisfactory and pays a large dividend, as it saves a number of service calls and gives greater satisfaction among our customers. At the same time, our demonstrator gets a number of prospects to whom she can sell a butane plant or stove. The first month our demonstrator worked we paid her a commission of five per cent above her salary and on her sales of $3700 her commission was $185. The second month her sales were $3900, and her commission $195. These visits to our customers have improved our relationship one thousand per cent; in fact, the ladies in many of their clubs throughout the country have invited us to put on demonstrations in their homes for their clubs without any cost to us other than the time spent.

I believe that a home service special-

Demonstrator

By J. R. HOLICER

Holicer Gas Company, Inc.,
Mansfield, Louisiana

ist is one of the most important employes to a liquefied petroleum gas dealer and they are in such demand that it is hard to get one without giving her some training. This will cost close to one thousand dollars, but will pay big dividends in a short time, as she can save a dealer's time, money and many complaints. But she must know the liquefied petroleum gas story from the plant to the home; the appliances and how they work; and she must have personality and be able to meet the customer in her home.

One of the first things that we did was to send our demonstrator through the factory and laboratory of the American Stove Co. at St. Louis, where she saw the entire process of stove manufacturing and learned just how long it takes and each thing that is done to make a stove. From there she went to the experimental kitchen at Cleveland, Ohio, which has helped her to solve many cooking problems. This gave her a very good background in the beginning of her training. Now she is repaying us handsomely for our investment in her. Our sales-service-demonstration plan is being justified.

Headquarters of Holicer Gas Company, Inc., Mansfield, Louisiana.

What of Supply?

Some Facts and Figures That Foretell the Long and Useful Life for L.P.G. Service

WHEREIN lies the permanency of the source of supply of liquefied petroleum gases? If the consumption rises rapidly will prices soar? What is the supply hazard of the dealer today and in the future? Is the consumer at the mercy of a limited production?

These are vital, pertinent questions, and unless they can be answered to the complete satisfaction of the user, the retailer, the distributor and transportation organizations, there would be an unrest not conducive to stable financing, new concerns would look with doubt upon entering the field, and those long deprived of power and light would lose the blessing that is now becoming rapidly available to them regardless of how far they are removed from urban centers.

A Happy Situation

Happily for all concerned, the existing and potential supply of liquefied petroleum gas is so nearly unlimited that no branch of the industry, nor those dependent upon its service, need have any misgivings for the future. And it is upon this premise that BUTANE-PROPANE *News* feels not only justified, but enthusiastic, in launching into this new field of endeavor.

Studying over the U. S. Department of Interior, Bureau of Mines Mineral Year Books, we find statistical information in the oil and gas industry which is really interesting. At the present time, and according to the A. P. I. figures on known proven oil reserves, it is safe to prophesy that the oil business is going to continue in its present magnitude for a few years more at least, and now there is treated daily some 5,600,000,000 cu. ft. of gas through gasoline plants for the recovery of natural gasoline.

For every 1000 ft. of gas treated, approximately one gallon of natural gasoline is produced. Some fields run higher than the average and others lower. This makes 5,600,000 gals. per day production. The average return to the natural gasoline producer is under 5c per gallon.

We have gone further and our engineers have studied the analysis of gases from the various fields and find for every gallon of gasoline produced approximately one gallon of liquified petroleum gases, including propane, is available in the wet gas. These products are not all being recovered today. Many plants are not designed to recover them. They will not all be recovered tomorrow. However, they are there and can be recovered when and if the market demand increases to justify the investment required to capture and handle them.

Recent improvements in gasoline plant design looking forward to the ultimate production of these more volatile products lead us to state that the ultimate recovery of the lighter fractions can be made at no greater cost than natural gasoline, and in many cases at a much lower cost. We are now consuming a little over 150,000,000 gals. per year or about 410,000 gals. per day. At the present rate of growth of the L.P.G. industry, namely, 30 per cent per year, it will be eight years before we equal the potential supply. And the source will increase with gasoline market increase.

Recently statements have been made that much of the liquid gases will be utilized by the refiner as charging stock for polymerization. To polymerize the unsaturated hydrocarbons such as propane, butane and iso-butane it is necessary that they first be changed to the unsaturated series—propalene butalene and iso-butalene. This is physically possible and has been done, but from an economic viewpoint it is unsound as long as the value of liquefied petroleum gases as fuel in their natural state is any place near the natural gasoline price. Butane and isobutane have been successfully cracked and the resulting product polymerized with a yield of approximately 1/3 gal. of polymer gasoline per gallon butane charged. Yields are much less with propane as a charging stock.

A contemporary writer during the first part of the year cited the trend of the manufacture of polymer gasoline from refinery gases with particular reference to two operating plants.* A thorough study of the process involved will show that the products polymerized are the propalene and the butalene, and if it were desired a considerable production of propane and butane could be produced from the gas remaining after polymerization was completed. This is a possible source of supply that has not been taken into consideration in our estimates.

*Indicates the possibility of the absorption of these products by gasoline manufacturer to preclude their use as a domestic heating fuel.

A Unique Position

Liquified petroleum gases have a place of their own in the field of distribution. They have a definite value to the user and command a price respect on a par with electricity, manufactured gas and natural gas. Due to the fact that they can be made available in areas and districts that cannot economically be served by natural or manufactured gas they deserve a price higher than these commodities for domestic use.

In the matter of utilization as engine fuel the use is confined to the commercial or agricultural user. Here they are competitive with gasoline and diesel oil, and should be priced for large bulk delivery to meet this competition. Eventually this market will strengthen as the users become cognizant of the superior qualities of these products, but for the time being to increase expansion along this line it will be necessary to be competitive with the inferior fuels.

In conclusion, the product is available, the market is waiting, and all that is needed for an unprecedented expansion of the industry is good judgment and safe practices on the part of those of us interested in the development and growth of the liquefied petroleum gas industry.

Milwaukee Crack Train Uses Bottled Gas To Speed Up Dining Car Service

MUCH economy and vastly improved comfort for employes and guests have resulted from the introduction of liquefied petroleum gas for use in cooking on dining cars of the four-a-day "Hiawatha" streamliners of the Chicago, Milwaukee, St. Paul & Pacific R. R. between Chicago and Minneapolis, according to F. R. Sweetnam, district manager of the Detroit-Michigan Stove Co., and L. H. Wright, of Philgas department of Phillips Petroleum Co.

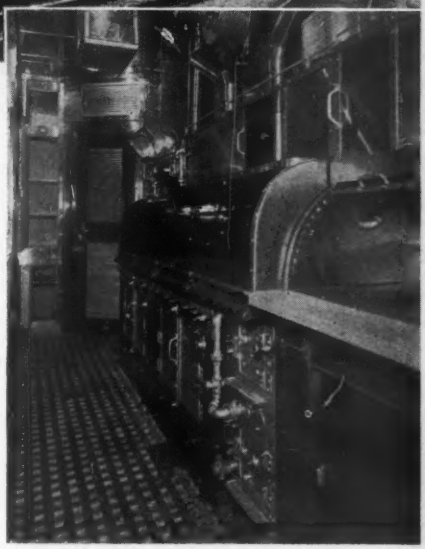
The Milwaukee Road has tried various fuels in the ranges in use in their kitchens on dining cars. Originally it used coal but this type of fuel required carrying between 450 and 500 pounds of coal with the dining car. This weight and the resulting ashes were very objectionable, to say nothing of the intense heat created in both the kitchen and dining car proper.

Sawdust in brick form was tried in place of coal. This eliminated ashes to some extent but the sawdust bricks took up considerable room in the kitchen and they still had trouble with intense heat in both kitchen and dining car. Next they tried oil burners fitted to the interior of the fire-box of the ranges. The oil burner, like the other fuels, did not eliminate the heat in both diner and kitchen.

Finally, it was decided to use liquefied petroleum gas, and there was recommended for use with it two sections of Garland 45-39 CXB ranges with the Garland 114-39 B Salamander broiler. Closed top construction was selected because it was similar to the coal range top to which the chefs were accustomed. It was easier to slide their stock pots around on a top of this kind. The ovens were fully insulated which assured cooler kitchens and dining cars and this in itself reduced the load on the air conditioner. Heat controls on the ovens reduced food shrinkage to a minimum and eliminated trimming roasts. The oven doors were of the split type, instead of the drop door, which gave them more room in the kitchen. A guard rail was mounted across the front of the top of the range to keep pots and pans from sliding off the top going around the curves. The ranges were anchored to the floor and all burners were fastened in place. A warming closet with sliding doors all made of monel was mounted on the high shelf. The flue pipes were also made of monel.

Broiling had been done on a charcoal broiler which had to be kept fired at all times during the dinner period whether in use or not, and this produced additional heat for both the kitchen and diner. With the gas-fired Garland broiler equipped with ceramics, it was only fired when in use, which eliminated excessive heat.

A model dining car was set up at the Milwaukee Road shops. Various tests were conducted, arrangements made for heating water with the gas for the bain-marie and dish-water, and the commissary department heads were



Milwaukee R.R. streamliner between Chicago and Twin Cities features new butane-equipped kitchen car for improved and faster service.

called in to make a careful inspection. They gave the equipment their stamp of approval and with this go-ahead signal, orders were placed for additional dining car kitchens.

Cooking on the "Hiawatha" is lots different than preparing meals in a hotel or restaurant.

Two things are of vital importance. Storage space for food is limited; however, enough food must be carried to complete the run. Limited seating capacity in a diner necessitates speed in serving passengers so that they do not have to wait too long.

On a day run, the first thing the dining car staff does when it gets aboard in the morning is to cook breakfast for the crew. After breakfast the roasts are placed in the ovens at the proper temperatures. Stock pot foods are placed on top of the range. When the train pulls into the depot everything is in readiness for serving the passengers.

It was found that due to the terrific speed of the "Hiawatha," draft equalizers had to be put on the flues. Draft conditions change considerably when a kitchen that has been standing still in a depot, becomes one that is sailing along on a straight stretch of track at 90 to 100 miles an hour. Also, air conditioning in the dining car had its influence.

On a good day's run the "Hiawatha" feeds 300 passengers and on a poor day 200. The fuel consumption averages 40 to 45 pounds of propane gas to operate two sections of Garland ranges including the Salamander broiler. Roasts are kept hot in the ovens at all times and certain top burners are in operation continuously. Fuel consumption does not vary between a good and a poor day's run, and the liquefied petroleum gas has been found to be quick, dependable, flexible, clean and economical.

SELLING

"Selling" Takes a Bow

IN its introductory bow to the butane-propane audience, this department wants first of all to get its readers straight on what they may expect to find—and not to find—on this page. You can expect, for instance, a lot of talk about sales and the job of selling. That is obvious.

However, you need not look for anything very theoretical on this big and engrossing subject. "Selling" is going to try to avoid the pedagog's point of view. We assume you readers know how to sell, that you already have mastered the fundamentals that may be learned in a classroom. What you are interested in is not fancy ideas spun out of a pot of ink. You want hard facts, dredged out of actual selling; slants and selling angles that you can grab hold of and apply to your business.

We propose to present month by month a series of brief, pithy articles on sales methods and salesmen winnowed from your and others' experiences in the field. Salesmanship is essentially a creative art; as basically creative as writing a novel or designing a building. And as the novelist and the architect draw from the fund of human knowledge and experience to perfect their art, so the salesman turns to his fellow men for inspiration and guidance.

"Selling" proposes to cover the butane-propane sales front from the dealer-salesman point of view, alert for novel approaches and methods of presentation which are bringing results. These we will pass on to the industry in general, together with other material of an inspirational and helpful nature. What we would particularly like to invite is communications from our readers.

You are having success with some particular manner of sales presentation you have developed. Why not share the benefit of that experience with the fellow members of your industry? You have discovered a new way to turn up prospects. Let the rest of the butane-propane world know.

Remember your own particular part of the industry will grow as the industry grows. The help that you in your locality can give a fellow dealer perhaps in another state means just that much more volume, just that much more chance for the industry to meet its competition.

Can You Pass a Test?

A NATIONAL selling organization, trying to determine what percentage of their sales staff knew their proposition perfectly, sent out a list of 150 questions to every man on the sales pay roll.

Out of 350 men who answered the questions, only six exceeded a grade of 90, and the majority were well down in the lower 70's. A few were as low as 30.

There is only one way you can be sure you know enough about your product to answer every question—ask yourself in the presence of a prospect if you are confident that you can meet every question he puts to you.

DOTTED LINE ROSCOE

"Congratulations, Roscoe. The Board has decided you're now a blue pin!"

Are you sure of yourself? Or do you feel nervous? Do you shrink from what the prospect is about to ask?

Knowledge is power. The salesman whose knowledge is only 70 per cent can expect to have 70 per cent or less selling power.

When a prospect offers an objection, it usually means that he needs some bit of information that you as a salesman, as expert on your product, are in a position to supply. Once you supply that information fully and confidently, the objection nine times out of ten vanishes, and you have brought yourself a step nearer the dotted line.

Five Bad Habits

A sales executive with long experience in handling men warns his sales force against five bad habits, one or more of which every salesman has a tendency to acquire.

First, there is the habit of alibi-ing. It is so much easier to let an excuse substitute for extra sales effort. The salesman who never admits defeat, never has to use an alibi.

The second habit—and one which will grow rapidly and insidiously unless rooted out at the moment it begins to form—is that of killing time. Nothing ever seems to happen to the person who waits for something to happen.

Third on the list is the bad habit of fussing over details. A salesman can very easily bury himself up to his neck in petty details if he allows this habit to grow on him.

And fourth, there is the habit many salesmen easily acquire — squawking: squawking over their territory, squawking over extra work, over this thing, and over that thing. Squawking is really a refined way of alibi-ing, when you come to analyze it.

And fifth and last is the habit of taking the words out of the other fellow's mouth. A salesman has a tendency to grow so used to hearing his own voice that he begins to dislike hearing anyone else's. And of all habits, this is the most difficult to correct.

Cherish a Cranky Customer

Any business organization* will make mistakes. Any business organization will slip at times. It is not so important to place the blame, to call down an employee, or chalk up an error against the people who make these mistakes. But it is important to help them make fewer mistakes. And most important of all is to teach them that customers are the only people who keep the business going.

Simple as this seems, there are people in business who do not seem to understand this. Remember this: a cranky customer, once pleased, is quickly turned into your most potent booster. He never forgets a good turn. He may seem to be more trouble than he is worth, but no business can thrive by pleasing only easy-going customers.

Cherish your cranky customers. Appease them. Go out of your way to please them. They are like valuable employees working without pay. Correct the faults they point out. Follow through on their suggestions. They may be pointing straight toward bigger profits.

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* Reprinted from "The Pilot Light" of United Gas Corp., Houston, Texas.

Relative Inflammability Limits of Gases Give Butane-Propane Safety Edge

MOST gases, including butane and propane, are not inflammable in their pure states. A spark plug can be operated in a tank of gasoline or butane-propane gas and no fire or explosion will result as long as there is no oxygen present.

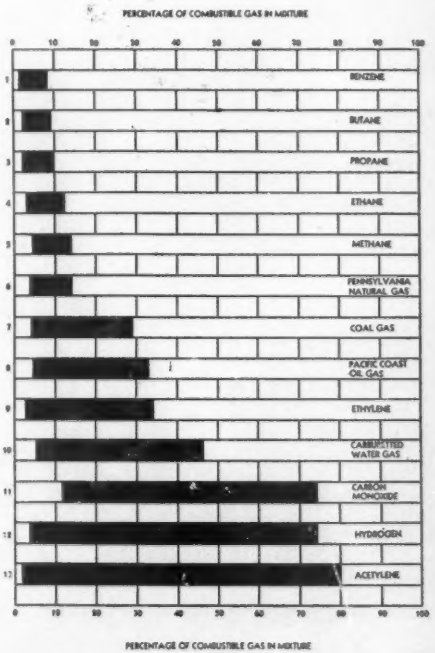
To make a gas inflammable it is necessary to unite it with a correct mixture of air. The limits of inflammability, upper and lower, is the range of percentage of gas to the gas-air mixture. For a specific example, refer to butane. This gas is inflammable when its proportion in the mixture is in the range of 3 and 9 per cent. In other words, if there is less than 3 per cent gas in the mixture it is too lean to burn, and if there is over 9 per cent it is too rich to burn.

This characteristic makes it possible to pre-mix air and butane over a wide range without danger of explosion or blow-back into the pipe lines.

Relatively, butane and propane have narrow ranges of inflammability as compared to manufactured gas, hydrogen and acetylene. This reduces the hazard of explosion below that of our other commonly-used gases, but also limits the use of the fuel. Closer regulation of burners and carburetors are required to support a propane flame.

The accompanying chart shows the comparative ranges of inflammability of some of the commonly-used gases. It was originally published in the manual of the National Butane Gas Co., manufacturing jobbers, of Memphis, Tenn., and is used with the permission of that organization.

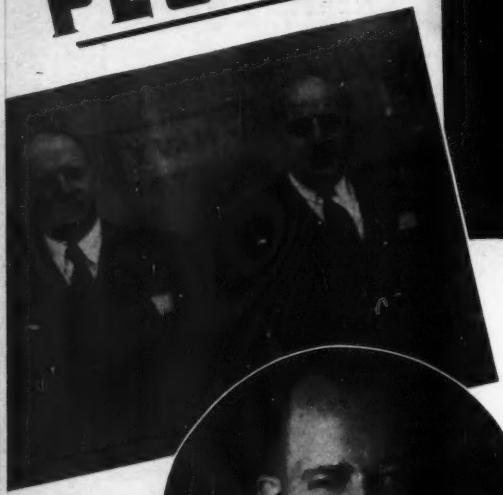
The heat values of commonly used gases, expressed in B.t.u. per cu. ft., are, Natural: 900 to 1100. Manufactured: water gas, 300; carbureted water gas, 500 to 600; coke oven gas, 550. Mixed gas: 800 to 850. Bottled gas: 2550. Butane gas: 3250. Butane-air: 550.



Inflammability limits of gases, showing narrow explosive range of butane and propane.

PEOPLE

ABOVE: W. A. Naumer, Carbide and Carbon Chemicals Corp., N. Y. and W. G. Bach, Skelgas Co., Kansas City, Mo. AT LEFT: A. N. Kerr, Imperial Gas Co., Los Angeles, Calif., beside Mark Anton, Suburban Gas Co., Livingston, N. J. And BELOW: H. E. Thomas, Phillips Petroleum Co., New York.



CIRCLE: Walter F. Verkamp, last year's president of L.P.G.A., Verkamp Corp., Cincinnati, Ohio.

BELOW: E. H. Gill, of National Butane Gas Co., Memphis, Tenn.

ABOVE: S. Kapnek, Natural Gas Co. of New Jersey, Hammonton, N. J.

RIGHT: K. W. Cole, Pressed Steel Tank Co., Chicago, and M. G. Farrar, Carbide and Carbon Chemicals Corp., New York.

BUTANE-PROPANE *News* welcomes pictorial contributions. Photos should be clear, glossy prints of men active in the industry. Most of pictures on these pages taken by A. E. MacGee, Skelly Oil Co.

ABOVE: B. D. Geroy, Illinois Bottled Gas Co., Chicago, and R. T. Bergh, George D. Roper Corp., Rockford, Ill. AT RIGHT: A. E. MacGee, Skelly Oil Co., Chicago; A. F. Maxon, Carter Oil Co., Tulsa, Okla., and J. W. Vaiden Skelly Oil Co., Tulsa, Okla. And BELOW: Franklin R. Fetherston, secretary and treasurer, L.P.G.A.

CIRCLE: J. Woodward Martin, new president of L.P.G.A., Lone Star Gas Co., Dallas, Texas.

Ben Symon, Shell Petroleum Corp., St. Louis.

ABOVE: C. L. Parkhill, Parkhill-Wade, Los Angeles. And

AT LEFT: R. R. Johnson, John Wood Manufacturing Co., Conshohocken, Pa., and E. O. Werba, Atlanta Gas Light Co., Atlanta, Ga.

Metallizing

A New Unit, Using Propane Flame, Opens the Path to An Unexploited Industrial Market

By R. A. AXLINE President, Metallizing Engineering Co., Inc., Long Island City, New York

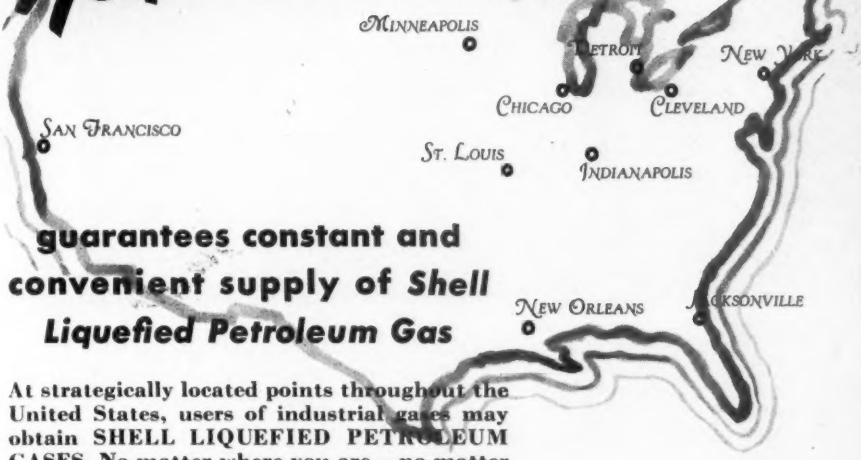
WITH the introduction in January, 1939, of the Metco Metallizing Unit using propane gas instead of acetylene or hydrogen, which had been the only gases used commercially for metallizing up to that time, the metallizing industry has become a new and unexploited industrial market for liquefied petroleum gases throughout the United States — a market which will grow to a considerable volume as the metallizing process becomes more widely known, and as the present users of metallizing equipment become acquainted with the advantages of these gases.

The metallizing gun may be likened to a miniature portable foundry (3½ lbs.) which melts and deposits any metal which can be obtained in wire form, on practically any base material. Compressed air, oxygen, propane, and the metal wire to be sprayed, are required for operation. The gases held at a constant pressure by regulators are fed to the gun by means of hoses. Part of the compressed air is used to operate a small high-speed air turbine, which provides the power to feed the metal wire through the gun at a constant speed. At the nozzle of the gun, the wire is melted by the oxy-propane flame, atomized by a compressed air blast, and sprayed out in the form of finely-divided molten or semi-molten particles of metal.

The particles of metal, upon reaching the surface to be coated, chill almost instantly, and key themselves into the crevices or interstices of the surface, effecting an extremely strong mechanical bond. No appreciable amount of heat is transmitted to the base material. Warpage, crystallization, heat strains, and the need for flux or preheating are all eliminated by building up with metallizing. Because of the lack of heat transmission, and elimination of fusion between the base material and the applied metal, dissimilar metals can be applied freely one upon the other. For example, stainless steel, or high carbon steel, can be applied with equal ease to steel, cast iron, bronze, aluminum, or the lower melting point metals, such as lead and tin. The application of sprayed metal on glass, wood, cloth and similar materials is equally adaptable.

The base material must be clean, dry, and rough in order that the sprayed metal may bond firmly. Paper, cloth, wood, and such materials, which are normally porous, need no prepara-

Nationwide Service



guarantees constant and convenient supply of *Shell Liquefied Petroleum Gas*

At strategically located points throughout the United States, users of industrial gases may obtain SHELL LIQUEFIED PETROLEUM GASES. No matter where you are—no matter what your requirements—in emergencies or in daily use, Shell can serve you.

Nation-wide technical service as near as your telephone . . . Shell maintains an expert engineering staff available to all customers—whether industrial or commercial. This service is prepared to assist in the design of equipment for the application of gaseous fuels.

Shell science stands behind Shell's sales force . . . In addition to their highly trained engineering staff, Shell Laboratories are constantly testing to insure the high standard of Shell Liquefied Petroleum Gases. Any technical problems can rapidly be solved through the use of these scientific facilities.

So remember—for economy and convenience—for expert engineering service—and for laboratory tested products—write or telephone Shell!

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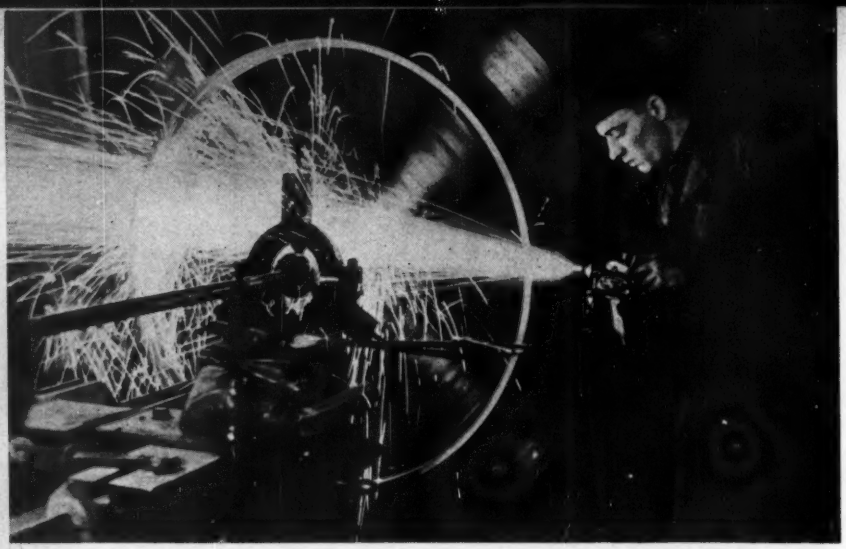


Wear rings of a large pump being built up with stainless steel by metallizing gun using propane gas instead of acetylene.

tion other than that they must be clean and dry. Metal surfaces are prepared for metallizing by sand or grit blasting, or by roughening with a lathe tool. Having properly prepared the surface of the base material, the sprayed metal can be built up to any desired thickness, after which it may be finished by machining, grinding, polishing, wire brushing—depending upon the metal applied and the final finish required.

Practical applications of the process may be divided into three classifications: (1) machine element, (2) corrosion resistance, and (3) decorative.

Under the first classification — machine element — the process consists of the restoration of the original dimensions of worn bearing surfaces and the application of wear-resistant surfaces to soft materials and non-metallic surfaces. Examples: superficial defects in castings; salvage of mis-machined parts; inserts of monel, nickel, high carbon steels, stainless steels or other metals to pump plungers, piston rods, and similar machine parts that are subject to wear and corrosion. In short, by virtue of the unusual characteristics of sprayed metal, hard surfaces with coefficients of friction far lower than those of hardened and ground steel are obtained. This frequently eliminates costly heat-treating operations, and produces surfaces that are superior to the original metal.

Under the second classification — corrosion resistance — the process is used for the application of a wide variety of corrosion-resistant metals to all types of equipments, ranging from nuts, bolts, and small fixtures that can be sprayed manually or in tumbling barrels, to large structures such as railroad bridges, barge and boat hulls, lock gates, water tanks and towers.

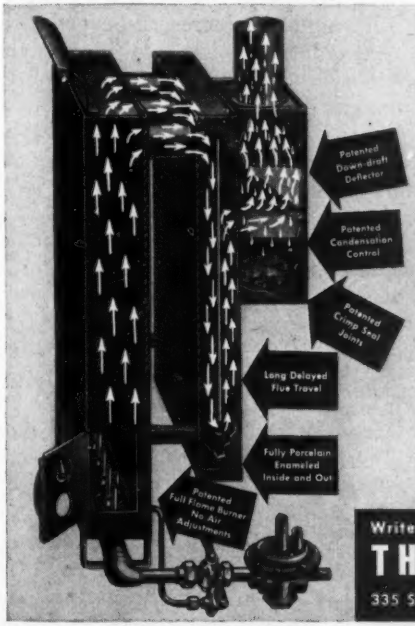
Metals commonly used for this purpose are zinc, aluminum, tin, lead, and cadmium. However, under certain conditions involving rigid technique,

Howle Economical Gas Heaters*

FOR BUTANE BOTTLED GAS

Howle Gas Fired Heaters open up a new market for you. Now small homes and flats in territories where natural gas is not available can have the comfort and convenience of even, circulating radiant heat, day and night, at amazingly low cost. Think of the selling points: clean, no dirt, no work, no coal to shovel, no ashes to lug. Perfect heat all the time at a very reasonable fuel cost.

Look at the exclusive construction features below. See why Howle Heaters are the most practical and efficient on the American market today


Patented Down-draft Deflector
Patented Condensation Control
Patented Crimp Seal Joints
Long Delayed Flue Travel
Fully Porcelain Enameled Inside and Out
Patented Full Flame Burner No Air Adjustments

*With or without automatic control

IN THREE EFFICIENT ATTRACTIVE SIZES

Vastly improved Armco enameling stock iron construction, full vitreous porcelain enameled throughout and corrosion proof (even against salt atmospheres). Finished in blended wood tones to harmonize with room furnishings.

MODEL	INPUT RATING	DIMENSIONS
A-30	30,000 B.T.U's	18x18x41
A-45	45,000 B.T.U's	18x22x44
A-60	58,000 B.T.U's	18x26x47

Write for Illustrated Folder and Complete Details

THE HOWLE COMPANY

335 SOUTH WESTERN AVENUE CHICAGO, ILLINOIS

nickel, monel, brass, bronze, copper, etc., may also be applied.

Aluminum has proved very successful in retarding heat corrosion or oxidation on exhaust manifolds, stacks, furnace parts and fire brick furnace walls, and similar equipment that is subjected to high temperatures. Aluminum is also widely used in the aircraft industry to prevent salt water corrosion, and for cylinder protection.

The third classification — decorative coatings — covers the application of metallic coatings to non-metallic surfaces such as glass, stone, concrete, plaster, wood, fabrics, acoustical materials, etc. Ornamental iron work, castings, grille work and other metallic surfaces are coated for decorative effects as well as corrosion resistance.

An exhaust fan rotor from water screen paint spray installation being metallized with a coating of zinc .008 inches thick to prevent corrosion.

Because of the many advantages of propane, it is believed that it will soon be the most widely-used gas for metallizing work. The greatest advantage of propane is, of course, lowered gas costs, although there are other factors, such as longer periods of operation without changing cylinders, lower transportation costs because of the lower tare weight and larger capacity of the propane cylinders, lower cylinder loss, and improved operating characteristics of the metallizing unit.

In considering the cost of metallizing work, the spraying speed (or speed of melting and atomizing the metal) must be taken into account, since by increasing the gas consumption of the gun it is possible to increase the spraying speed. However, when the gas consumption is increased beyond a certain point, the increase in spraying speed no longer compensates for the increased gas costs. Likewise, using larger size wires increases the spraying speed, but if wires of too large size are used, the resultant coating is inferior in structure and strength. It so happens that the most economical spraying speeds are almost identical, whether propane or acetylene is used; also, the wire sizes recommended for propane to obtain the best coatings are the same as acetylene. Therefore, it is possible to compare the gas costs, using the two gases, directly without regard to overall costs (labor, metal, compressed air, etc.) because they will be practically identical in either case. Gas consumptions and mixtures vary with the particular metal being sprayed. When acetylene is used, gas

·CRANE·
The world's foremost line of gas water heaters, built in a complete range of types and sizes, all adaptable to use with liquefied petroleum gases. . All backed by the Crane name and its 84 year reputation for quality. . Nation wide distribution through Crane Branches, Wholesalers, Plumbing and Heating Contractors.

NEW! DIFFERENT!

Packed With Interest For Propane-Butane Prospects!

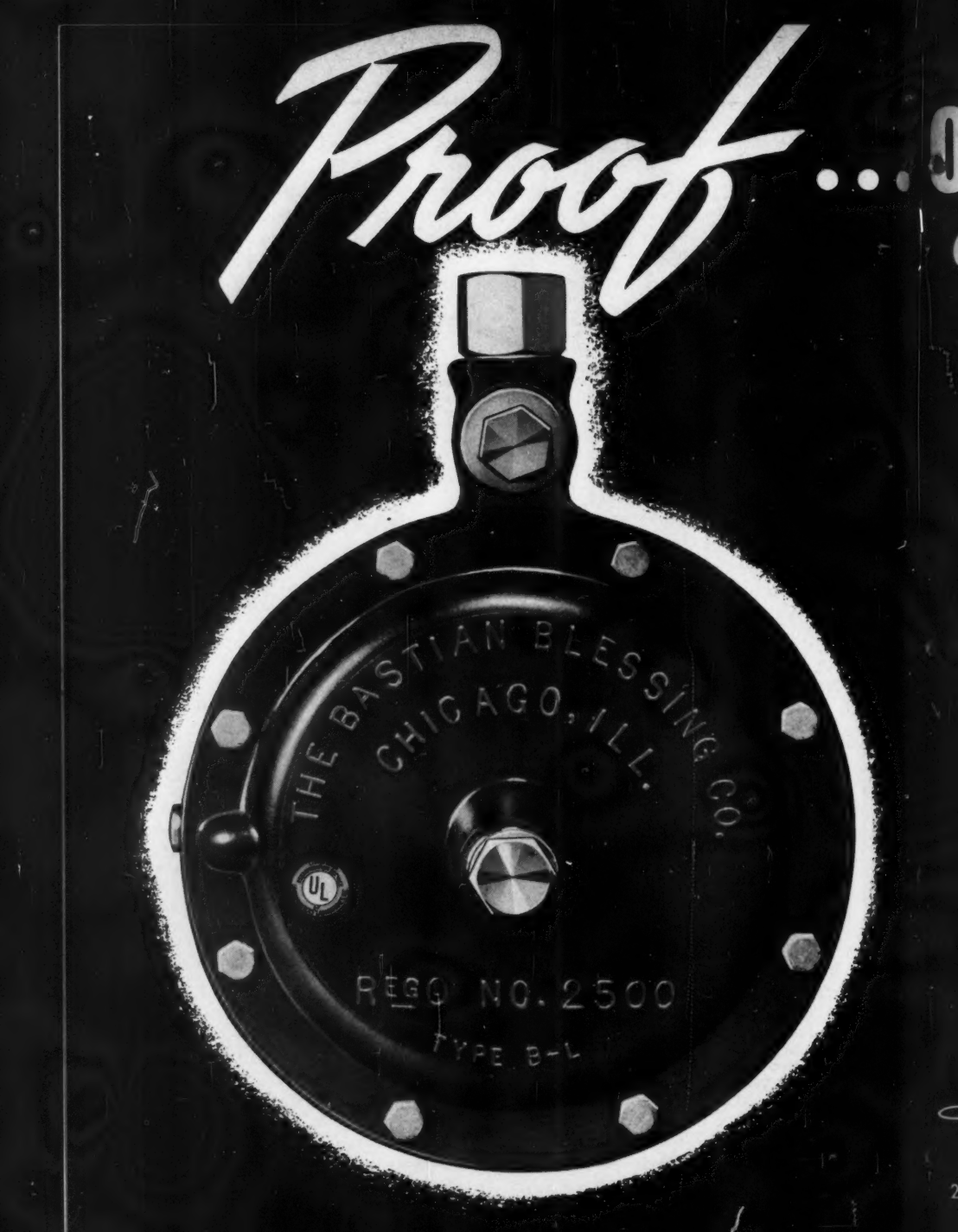
● Here is a product that opens vast new sales possibilities in the propane-butane field—the new Crane Superior Automatic Gas Water Heater with MINI-MISER!

MINI-MISER (patent applied for) is a revolutionary development in water heater construction that minimizes stand-by loss, cuts fuel bills. It has a powerful appeal to people beyond the gas mains, since it gives them de-luxe automatic hot water service, 24 hours a day, at minimum cost!

Moreover, the Crane Superior requires NO special equipment, NO extra charge, for adaptation to liquefied petroleum gases! Here is a sales "natural," not only for present users of propane and butane gases—but for thousands of brand new prospects. Everybody wants *modern* hot water service. The Crane Superior gives it to them—in its finest form!

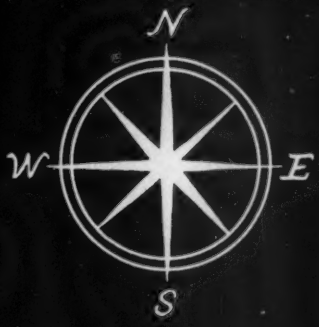
Investigate. Complete details sent on request. Also information on the entire Crane line with its full range of types and sizes for every water heating requirement. Write.

PREMIER HEATER DIVISION
LAPORTE, INDIANA


Proof . . .
THE BASTIAN BLESSING CO.
CHICAGO, ILL.
UL
REGO NO. 2500
TYPE B-L

OF REGO SUPREMACY

Comes From Every Direction



North, South, East and West – you'll find installations of the RegO 2500 regulator . . . a true example of RegO supremacy.

RegO regulators are designed specifically for your industry. They incorporate large diaphragms, they are built of special materials that resist the chemical action of liquefied petroleum gases and their design and development are the result of experience acquired by intimate contact with the industry since its infancy.

It is not economical to use small size regulators; the larger the diaphragm the better the service.

The regulator is the heart of any gas system . . . don't gamble with its performance, safety and real economy by saving pennies in first cost, then spending dollars for service and replacement.

INSURE AGAINST HIGH SERVICE COSTS—
SPECIFY REGO REGULATORS.

The BASTIAN-BLESSING Company

258 E. ONTARIO ST. CHICAGO, ILL.

TABLE NO. 1. A COMPARISON OF PROPANE AND ACETYLENE COSTS IN METALLIZING PROCESSES

Metal Being Sprayed	Wire Size	Spraying Speed* Lbs. per Hr.	Gas Costs per Hour (Dollars)		Savings Made per Hr. by Using Propane (Dollars)
			Using Acetylene	Using Propane	
Aluminum	⅛ in.	5.8 to 6.3	$1.28	$0.81	$0.47
Babbitt	⅛ in.	55.5 to 60.0	1.28	0.76	0.52
Brass	11 B&S	11.9 to 13.9	1.28	0.81	0.47
Tobin Bronze	11 B&S	11.2 to 14.5	1.28	0.81	0.47
Cadmium	⅛ in.	53.0 to 59.0	1.28	0.76	0.52
Copper	11 B&S	10.2 to 11.5	1.28	0.81	0.47
Iron	11 B&S	5.3 to 6.8	1.07	0.84	0.23
Lead	⅛ in.	96.0 to 107.0	1.28	0.76	0.52
Monel Metal	11 B&S	6.2 to 7.1	1.12	0.84	0.28
Nickel	11 B&S	5.1 to 5.7	1.12	0.84	0.28
Stainless Steel	11 B&S	5.0 to 6.9	1.12	0.76	0.36
Low Carbon Steel	11 B&S	5.3 to 6.8	1.07	0.84	0.23
High Carbon Steel	11 B&S	5.6 to 7.1	1.07	0.84	0.23
Tin	⅛ in.	57.6 to 64.0	1.28	0.76	0.52
Zinc	⅛ in.	27.6 to 29.0	1.28	0.76	0.52

*Spraying speeds vary according to fineness of atomization required for the particular work being sprayed.

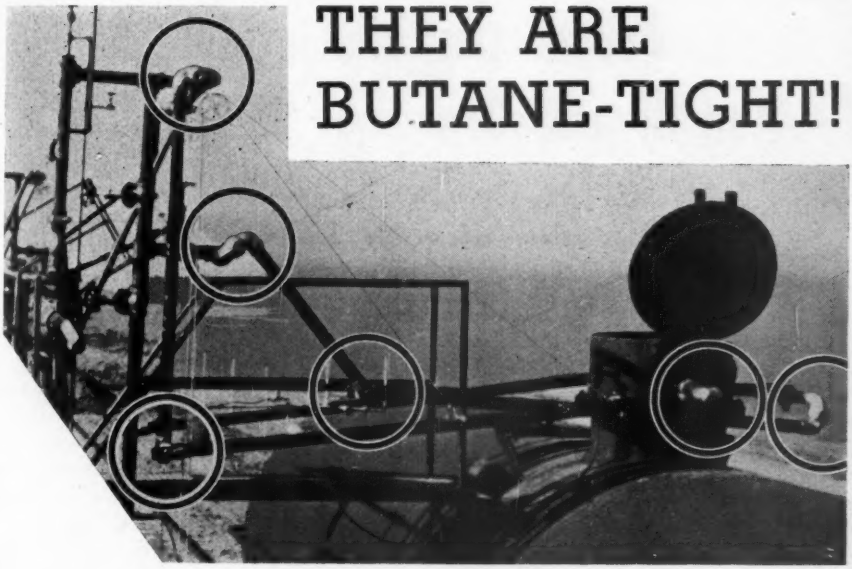
consumptions are: acetylene, 22 to 32 cu. ft. per hour; oxygen, 48 to 52 cu. ft. per hour. When propane is used, gas consumptions are: propane, 9 to 13 cu. ft. per hour; oxygen, 48 to 72 cu. ft. per hour. Using prices of $2.50 per hundred cu. ft. for acetylene, $8.50 per hundred pounds for propane (1 cent per cu. ft. approximately), and $1 per hundred cu. ft. of oxygen, we have the comparative gas costs shown in Table No. 1.

Thus, the savings that can be made by using propane gas are very large, amounting to from 23 to 52 cents per hour, based on the prices for gas as shown. The amount of saving possible in any particular locality depends, of course, on local gas prices. In many cases the savings are much larger than those indicated.

Translated into daily, weekly, or yearly figures, the savings in gas transportation costs are likewise very large. When it is considered that one 100-lb. cylinder of propane, with an average tare weight of 145 lbs., will last as many spraying hours as eight 250 cu. ft. cylinders of acetylene (with an average tare weight of 200 lbs. each, or 1600 lbs.), the amount of this saving will immediately become apparent. At the same time, unless manifolding is used, the acetylene cylinders must be changed eight times, and the propane cylinder only once — also a substantial saving.

All in all, it is probable that propane will soon be the most widely-used gas for metallizing work, as its advantages become clear to the thousands of users of metallizing equipment. This new market is now available to manufacturers and distributors of propane.

THEY ARE BUTANE-TIGHT!



★ STYLE No. 40
1-Way Swivel

★ STYLE No. 30
1-Way Swivel
Sizes:
3/8" to 10"

CHIKSAN *Ball-Bearing* Swing Joints combine maximum flexibility with maximum safety. Double rows of hardened steel balls hold the joint in perfect alignment and also maintain a pre-regulated thrust load upon the packing element. This method of construction assures full 360° rotation without sticking or binding and provides a joint that is fluid-tight, gas-tight and vacuum-tight. No tightening or adjustment is required. Play safe and standardize on CHIKSAN Swing Joints on all flexible Butane and Propane lines. Write for latest catalog.

CHIKSAN BALL BEARING SWING JOINTS

CHIKSAN
OIL TOOL CO., LTD.
FULLERTON, CALIFORNIA

Dealer Cooperation Means More Sales And Greater Consumer Satisfaction

By F. P. De LARZELERE

Sales Director, National Butane Gas Company, Memphis, Tennessee

FROM a manufacturer's viewpoint, there are two ways to sell merchandise; one by selling to a dealer or distributor, and letting him, after the merchandise has been received, dispose of it the best way possible; and another method, the one that our company believes to be the best, is not only to sell the merchandise to the dealer or distributor, but to assist him with sales plans to sell his consumers, as we have always believed that merchandise is not sold properly until the consumer has complete satisfaction and the distributor has received a legitimate profit from the sale.

The liquefied petroleum gas business is still in its infancy. The underground division is growing rapidly, and there are many people entering it; however, all is not gold that glitters. Our company has always tried to furnish the gas distributors and dealers with the experience of others in the field, from which a suitable plan can be adopted to fit the new dealer's picture in his own local community.

In keeping with this concept, our company is now planning a butane gas school covering technical data, servicing, and sales, which is expected to be held in Memphis during the month of July or August to make available trained personnel to our dealer organization. This school will cover in this brief period all phases of the underground butane gas business, including equipment and appliances.

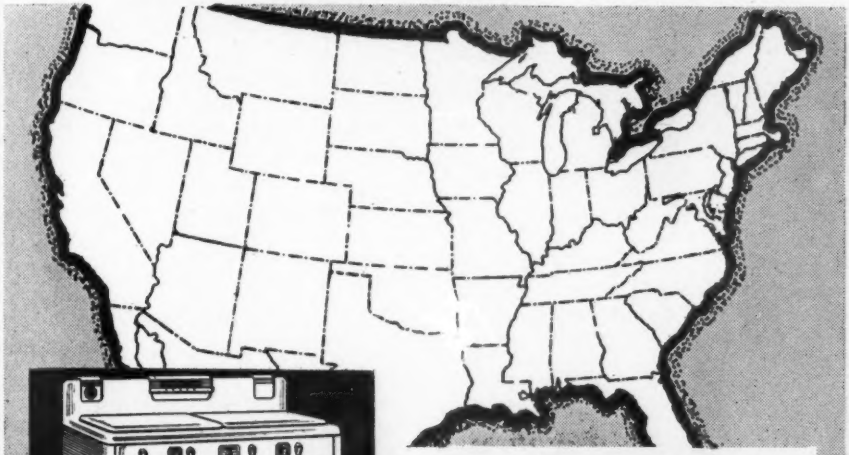
Merchandising has not been done in the same manner in this new underground business as it has been, and is being done, in some of the older established bottled gas businesses. The reason for this, we believe, is lack of cooperative plans, and also competition is not quite so keen, as there is still virgin territory for underground business.

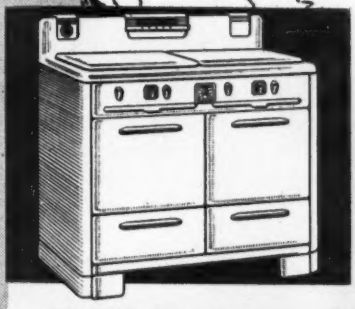
Our company has always believed that its success lies entirely with the success of our dealer organization. Every effort is put forth by our sales organization to assist the dealer in merchandising on a sound basis by spending considerable time helping work out his problem, summarize his potential, and help to formulate a plan, not for one year, but for a number of years, that will guarantee successful operation.

In turn, our dealer organization furnishes us with suggestions and plans which have been tried and proven in their respective communities. This information is passed on to each distributor, making available for him merchandising and promotional ideas not only gathered from one source, but from many.

We have adopted in our organiza-

Endorsed by BOTTLED GAS DEALERS *throughout the Nation!*





ROPER GAS RANGES

ROPER Gas Ranges Built for Use with Bottled Gas

The Roper Gas Range is "tops" with Bottled Gas dealers everywhere. It's "tops" because it fits the picture perfectly. You see, Roper has been designed with the Bottled Gas industry definitely in mind.

You'll find Roper installations wherever bottled gas is sold. "America's Finest Gas Range" is also known as "America's Finest" for use with Bottled Gas.

GEO. D. ROPER CORPORATION

General Sales Offices and Factory: Rockford, Ill.

tion, and pass on for what it is worth, the "P.A.P.A. PLAN," defined as: P—Problem; A—Analyzed; P—Plan; and the last and most important, A—Action.

Quotations from one page of our sales manual on the subject of "Working a Territory" may suitably illustrate the character of concrete suggestions offered our dealers for sales help:

The First Sale

"Naturally, the first sale you make in a new territory, and also if you are new salesman in this line, is the most important you will make. Select a 'leader' in each neighborhood. Ascertain all about him before you ever approach him—his finances, his contacts, his influence, his tastes, his hobbies. In every community, there are to be found so-called 'key people,' such as secretaries of various luncheon clubs, public officials, bankers, newspapermen, farm leaders, and others, who daily come into contact with and have an influence over a large number of people.

"The County Home Demonstration Agent is one that should be cultivated. A complete demonstration should be given her. While she cannot recommend any particular system, she can tell about the advantages of butane gas. She will give cooking demonstrations, and to lend her a demonstrator and appliances for her to carry on these demonstrations, will be worthwhile.

"Architects, contractors, builders, farm implement salesmen, creamery and home lighting representatives are people to contact and maintain contact with, because they see daily many of the very kind of prospect that would most likely be interested in butane gas.

"There is a wonderful field in the smaller city and town that is without gas. The banker, merchant and postmaster can be of invaluable help to the salesman.

"Creating the interest of a popular and substantial merchant to the extent of getting him to permit the placing of a kitchen range and a demonstrator in his place of business, and with handbills advertising the demonstration, covering a period of two or three days, should bring results. There should be no effort made to sell during this demonstration time. List names of those who appear at the demonstration, later classify them as to prospective customers, and follow-up. The baking of biscuits, or of cake, the making of coffee, and other cooking always attracts the interest of people. It is advisable to make a list of people that you'd like to have come, mail them a card, inviting them, and through selection you do away with a large crowd which might congregate through curiosity only. However, the problem exists of overlooking a prospect, which might later be resented, and much care must be exercised if you are to select your attendance.

"Make a list of 'most likely prospects' from the data secured in making the contacts outlined above, then lay grounds for an intelligent campaign of attack. Does his wife already indicate by the use of other modern conveniences that she is interested in increasing the beauty and comfort of her home?

"Finally, in the beginning, do not waste time by failing to analyze whether each one really is a likely prospect."

Why it pays to insist on

STANDARD

LIQUEFIED PETROLEUM GASES

STANDARD liquefied petroleum gases give you all these advantages: (1) *Highest quality*—assured by Standard Oil's superior refining facilities; (2) *Prompt deliveries* and unfailing supplies—assured by ample tank-car equipment and the largest distributor fleet of high-pressure tank trucks in California and Arizona; (3) *Complete odor safety*—assured by the protection of "Calodorant" gas-odorizing agent; (4) *Helpful service*—Standard Oil engineers, technicians and distributors are always ready to work with you in the development of processes for the most efficient use of these fuels.

Ask any Standard Oil representative for further information.

CALOL Reg. U. S. Pat. Off.
INDUSTRIAL GAS No. 1
(Commercial Butane)

For: Gas manufacture or enrichment; Industrial fuel; Chemical and metallurgical purposes. (Facilities available for tank-car delivery, and tank-truck delivery)

CALOL Reg. U. S. Pat. Off.
INDUSTRIAL GAS No. 2
(Commercial Propane)

For: Domestic fuel purposes; Industrial fuel; Steel cutting, brazing, etc.; Chemical and metallurgical purposes. (Tank-car delivery, and steel-cylinder delivery—91-lb. or 41-lb. capacity)

BU-GAS Reg. U. S. Pat. Off.
LIQUEFIED PETROLEUM GAS

For: Heavy-duty internal-combustion-engine fuel; Industrial fuel; Heavy-demand domestic fuel purposes. (Tank-car and tank-truck delivery)

STANDARD OIL COMPANY OF CALIFORNIA

New Propane Bulk Plant at Vancouver, B. C., Indicates Growth in the Northwest

By HAROLD W. WICKSTROM

Consulting Engineer, Los Angeles, California

ONE of the most recent bulk plant installations, made at Vancouver, B. C., proves of wide interest because it involves several new and unique methods of handling, and because it represents the growth of the bottled gas business in a territory that embraces a huge potential outlet that is yet to be developed.

Bottled Gas, Ltd., managed by C. F. Pearson, of Vancouver, B. C., is the culmination of the efforts of the original Rockgas Co. in that area, which started from a small distributing unit for bottled gas to a company that now has 19 supply depots besides its main plant and offices in Vancouver. The territory covered by this company embraces some of the most remote distribution points geographically that are encountered anywhere. The main volume of business is concentrated around Vancouver and Victoria, but many of its supply depots are at locations that the average operator in the United States would visualize as being entirely beyond reach.

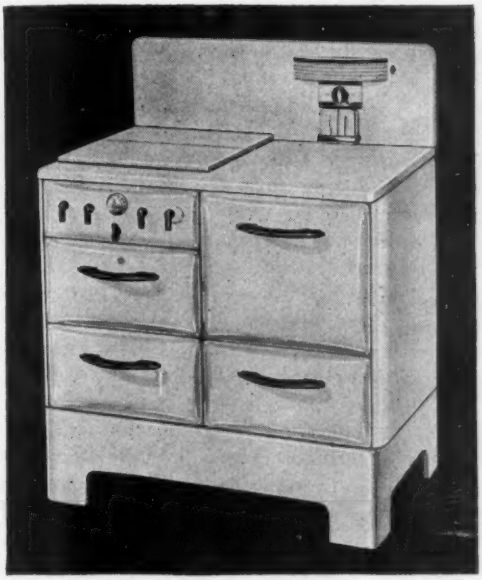
The company, besides operating for the benefit of its owners, is doing a service to the residences of the remote mining and fishing towns in British Columbia by affording them a gas service. Besides this type of distribution, it also has a well-developed dealer set-up in the agricultural regions near Vancouver, and enjoys a substantial business in furnishing fuel for commercial and pleasure boats that ply the northwest waters.

Previous to this year, all of its fuel was shipped in I. C. C. containers from California, but the growth of its business justified the installation of bulk storage at Vancouver and a bottle filling plant to take advantage of freight savings. The company selected a site for its plant in the heart of the commercial district of Vancouver served by rail and main highway and close to the water's edge to provide for marine shipments. The requirements of the fire department of Vancouver made the installation of underground storage mandatory. As a consequence a 13,000-gal. tank (illustration shows tank being lowered into incubator) was installed with a 4-ft. cover. The tank was built to A.S.M.E. code requirements and thoroughly coated to prevent corrosion.

The major problem presented was to provide satisfactory pumping facilities to handle the liquid gas from an underground tank without the introduction of unnecessary hazards of open pits, and due to the high normal precipitation of the area, combined with a high water level, to adopt some method of pumping that would not find the pumping unit practically submerged in water most of the time.

The problem was presented to A. Hol-

DETROIT JEWEL and GARLAND RANGES for BOTTLED GAS



THE "JUBILEE PACEMAKER"
Never before so good a range at so low a price!

are Manufactured by PIONEERS *in the Field of Bottled Gas Appliances–* DOMESTIC *and* HEAVY DUTY

Customer satisfaction with the use of bottled gas depends to a large extent upon the engineering of the appliances with which it is used — the experience of the manufacturer in this field and an understanding of the problems involved.

The Detroit-Michigan Stove Company is a pioneer in the manufacturing and merchandising of bottled gas appliances. Detroit Jewel and Garland Ranges in the domestic field and Garland Heavy-Duty Ranges have established and maintained reputations for efficiency, economy, and dependable trouble-free service.

See our "Ranges of Tomorrow" at the New York World's Fair.

Catalogs and Complete Information Sent Upon Request

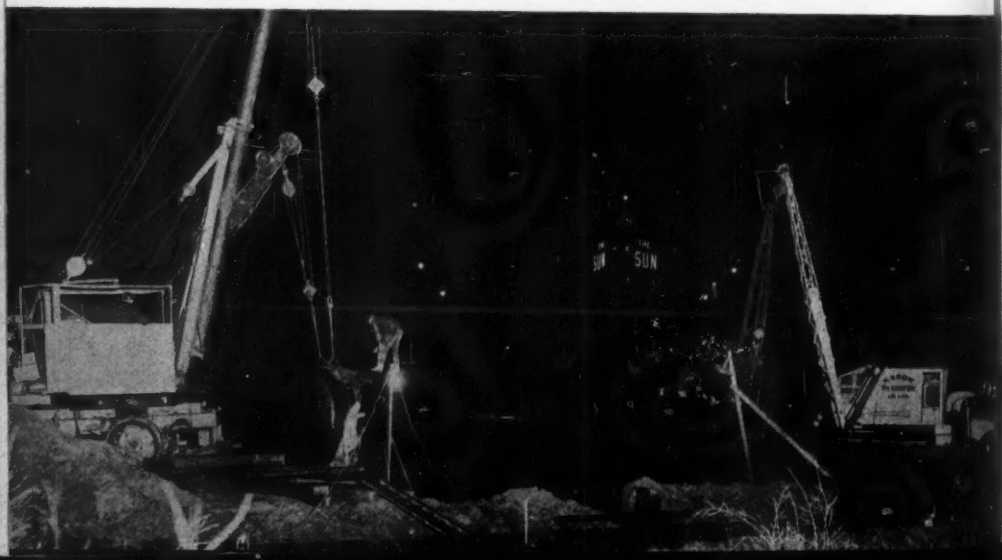
DETROIT-MICHIGAN STOVE CO. • DETROIT

lander, chief engineer of the Byron Jackson Pump Co., of Los Angeles, Calif., an outstanding hydraulic authority and one of the joint designers of the huge 9000 hp. pumping units installed in the Colorado river aqueduct which will supply water to Southern California cities in the fall of this year. His solution of the problem was an adaptation of the submersible motor type pump for the job. This is a common centrifugal pump directly connected to a motor designed to operate submersed in a bath of oil. The entire unit is installed in a casing and can be operated at any depth. To furnish sufficient suction head to successfully pump propane without undue vapor lock requires a static head of approximately 8 ft. To gain this static head a 23-ft. casing was built with the pump and motor installed in the bottom and the entire casing sunk into the ground similar to a deep well pump. The suction to the pump is from two 1½-in. dip pipes coming out of the top of the tank. To prevent loss of suction in case of foot valve leakage on the dip pipes, a large suction reservoir is provided in the pump barrel which allows the pump to start moving liquid till such time as the pressure differential causes the liquid in the tank to flow into the pump suction. On the initial tryout the pump unloaded a 10,000-gal. tank car of propane in 2½ hours. The same pump is used to fill cylinders.

The cylinders used by Bottled Gas, Ltd., are Standard I.C.C. cylinders equipped with ordinary P.O.L. valves. The fitting rack is provided with two scales at the present time, with provision for installation of more when required.

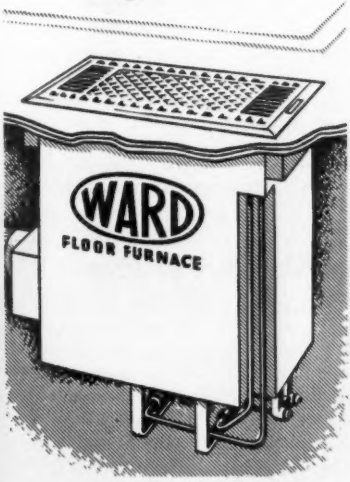
The bottles are connected to the fill header with hose connections. The pump is designed with a head capacity curve to provide sufficient pressure to fill the containers without bleeding. The method of filling is as follows: The operator sets a cylinder on each scale and makes the necessary connections and sets the tare weight balance and the capacity weight balance. The valves in the hose line and tank are opened and the liquid enters the tank.

Lowering 13,000-gallon propane tank into excavation, Vancouver, British Columbia.



100% Safety Pilot..

A FEATURE OF THE 1939 WARD BUTANE FLOOR FURNACE



HELPS YOU MAKE SPACE HEATING PROFITS FROM BOTTLED GASES

READY FOR DELIVERY ABOUT JULY 1

It is a positive and certain guardian of the safety of the house . . . this new 100% Safety Pilot of ours. And when we say "100%" we mean it emphatically. This really is a dual pilot that provides a *double* element of security. If the flame is extinguished it *immediately* and *completely* shuts off flow to burner and also stops the pilot feed. *Not one bit of gas can escape.* And pilot cannot be re-lighted until it is turned on by hand.

Add this to the other fine features of the WARD FLOOR FURNACE and you have a source of space heating profits that no marketer of butane or propane gases can afford to overlook.

A copy of our new catalog and price list will cost you nothing. We'll send them at once on request.

WARD HEATER COMPANY

LOS ANGELES, CALIFORNIA

BUILDERS OF FLOOR FURNACES FOR THIRTY YEARS

When the proper filling weight has been reached, the scales beam trips a Mercoid switch which in turn closes a solenoid valve on the fill line, preventing additional fuel entering the tank. To provide for circulation to prevent the need of starting and stopping the pump on completion of filling containers, a Fisher differential control valve is installed in the pump discharge line which opens at a predetermined pressure, allowing the liquid to bypass back into the main storage tanks.

The accuracy of the scales and automatic shut-off is ½ lb. plus or minus on a 70-lb. bottle. Time required to fill a container is just under six minutes. The pump has sufficient capacity to fill 10 containers simultaneously at the same rate, but operates equally as well on one or two at a time.

One of the novel and important features of this job is the elimination of packing glands with their inevitable leakage. The submersible pump having both the motor and the pump in an enclosed barrel eliminates entirely any gland packing problems on the pumping unit. The Fisher differential governor is the packingless type and the shutoff valves on the filling manifold are of the diaphragm type. The only packing glands to contend with are in the larger pipe valves in the system, but these are operated so seldom little or no trouble is experienced in keeping them tight.

At present all of the product of Bottled Gas, Ltd., is being distributed from its bulk plant in containers of 10 to 300-lb. capacity. The company is planning to expand into the semi-bulk users and provision was made to provide for loading tank trucks, and if necessary to meter fuel into automotive equipment. This newest of the bulk plants represents some marked engineering and safety improvements and places Bottled Gas, Ltd., of Vancouver, B. C., in a position to further expand its growth at even a more rapid rate than in the past.

The engineering and installation of this plant was done by the author with the assistance of A. Hollander, chief engineer of Byron Jackson Pump Co., and Ted Myers, mechanical engineer with Hoffars, Ltd., of Vancouver, B. C.

■ ■

Metropolitan Store Develops Evening Sales Practice

Barker Bros., of Los Angeles, one of the largest dealers in the world in household wares, recently experimented with a new sales idea that provided for the store remaining open one evening every week to permit housewives to have the support of their husbands in making what are termed "capital purchases," or those involving large expenditures, as for gas stoves, water and space heaters and Electrolux refrigerators. The inability of men to visit the store during daylight business hours often prevented, or long postponed, the purchase of appliances greatly desired by the housewife.

The trial of the plan was made on two successive Wednesday evenings. The crowd that responded the first evening totaled 4300. This definite success resulted in a decision to make it a regular weekly practice, and the results are positive evidence of the practicability of the new sales plan.

■ ■

Hydro-Gas Builds Plant

The Hydro-Gas Sales Corp. of San Saba, Texas, is building a new bulk storage plant in San Saba, a distance of 40 miles from Lampasas, where a similar plant is already in operation. Each are large-capacity underground systems.

R. L. Edwards, of San Antonio, is the distributor in this district for Hydro-Gas plants and for appliances for use with liquefied petroleum gases.

A Commercial Oven Can Be Sold As Easily as a Kitchen Range And It Consumes

10 TIMES AS MUCH GAS

INCREASE

YOUR PROFITS

with

BLODGETT OVENS

Write for Details

Blodgett Ovens have been standard since 1848 and a complete line of many models and sizes is available. Write now for folders and prices.

It is only natural that the road to greater profits lies in selling appliances which will build up your load. Commercial appliances, like Blodgett Ovens, for instance, consume ten times as much gas and are just as easy to sell as a Kitchen Range. Every hotel, restaurant, bakery and camp, whether large or small, is a prospect. Don't overlook this big market and your opportunity to cash in on the sale of Blodgett Ovens. Even the smallest commercial kitchen can afford one.

When ordering ovens, specify the B.t.u. content of the gas, its specific gravity and pressure at the appliance.

THE G. S. BLODGETT CO., Inc. Burlington, Vermont

When the customer comes to William Althoff he has a full line of liquefied gas appliances to show.

• **The accompanying paper was presented by William Althoff during the spring dealer convention at the invitation of B. D. Geroy, of the Illinois Bottled Gas Co., in Chicago. It is a story of merited success, told in the home-spun style of a self-made salesman whose business is located in West McHenry, Ill. — Editor**

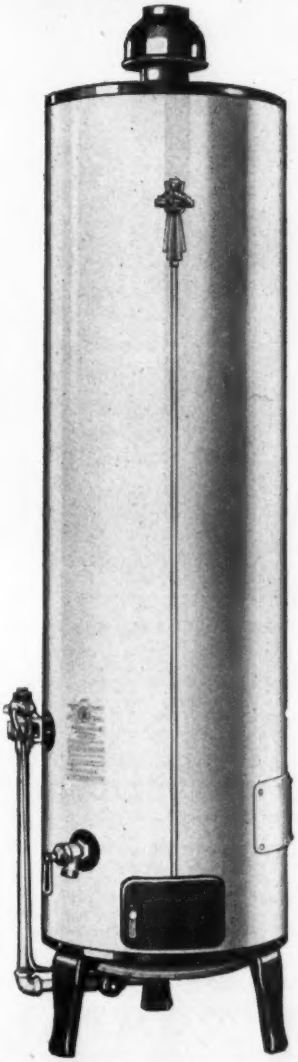
Illinois Dealer Boosts His Retail Sales With Demonstration Trailer

I CAN truthfully say that I have made a success of the hardware business, so far, and I intend to make a further success. I say that without any apology and believe that the reason I have made a success is because I followed simple lines of selling. And one of the first and simplest principles is to sell the lady of the house. It's a known fact that the women buy 80 per cent of all material for the homes, either directly or indirectly. If Pa goes to town to do the shopping, you can bet he has instructions from Ma what to buy, and if he doesn't buy what Ma wants, it's a cinch it'll go right back to the store.

Twenty-four years ago I started out selling what was known as protane gas and the first thing I did in selling this fuel was home demonstrating. However, back in the days when we were selling protane, we sold the lady of the house an old dilapidated black stove with two tanks of gas and charged her $172. Today we can walk in and offer her something really beautiful, a stove that is porcelain enamel throughout, insulated oven, etc.

Several years ago I found another method that proved very successful, and that was trailer selling. Believe me, I hesitated before purchasing the trailer because I knew it would cost me about $700, and I wasn't sure it would bring back 7c. Now it is my opinion that a trailer will pay for itself within three months. When I first took my trailer out, I started one Sunday morning at 10 o'clock to call on prospects. When I returned at 5 o'clock I had sold $2100 worth of merchandise. Incidentally, I lived in a resort area, which meant that many prospective purchasers could afford to buy.

WHY YOUR CUSTOMERS WILL BE MORE SATISFIED WITH A



DAY AND NIGHT

"America's Finest Water Heater"

ECONOMY

The Heatwave Flue and Heat Trap are patented inventions found only in Day & Night water heaters. They extract more heat from the gas burned, assuring low operating cost, and customer satisfaction.

SAFETY

ALL DAY and NIGHT Butane and Propane gas water heaters are equipped with the Grayson Unitrol Safety Pilot Control, the 100% safety device. In case of pilot failure, BOTH pilot light and gas supply are automatically cut off.

DAY AND NIGHT

Water Heater Company

MONROVIA, CALIFORNIA

NEW FISHER
BOTTLED GAS REGULATOR
with positive stop, throw-over manifold!

NEW ★ EXCLUSIVE DESIGN ELIMINATES MANIFOLD BREAKAGE

FISHER'S new improved manifold has two separate shut-off valves operated by throw-over lever. Positive stop at each end of the lever's travel arc eliminates manifold breakage. Practically wear-proof!

FISHER'S New Regulator for Two-Drum Bottled Gas Service incorporates two manifold valves operating on an internal cam leverage principle—rather than the conventional thread or screw principle. This new and improved manifold is of the diaphragm packless type and the lever **always** points to cylinder from which gas is being used. Lever comes to a positive stop at each end of its travel arc. This feature lengthens service life and reduces service calls because the user cannot break internal parts by turning the lever the wrong way!

CAPACITY—95 cu. ft. Propane gas per hour on 10 lbs. cylinder pressure per sq. in. Capacity considerably greater for higher cylinder pressures. Manifold bodies forged bronze. Standard copper tubing pigtails and POL inlet connections. Outlet ⅜ in. thread Underwriters Laboratories approved. Investigate this new regulator without delay!

Write Today for information and latest prices on TYPE 721-M and other FISHER Regulators for the Gas Industry.

FISHER GOVERNOR COMPANY

901 FISHER BUILDING
MARSHALLTOWN, IOWA

Complete Line of Other Bottled Gas Regulators, Connections, Fittings, etc. Also Special Design Regulators for Butane Service Industrial Plants.

Mr. Althoff's trailer-kitchen standing before his McHenry, Illinois, store in which are featured products of the Illinois Bottled Gas Company.

One day I called on a prospect who was a hard-working farm wife, the type that feeds the chickens, the hogs, milks the cows and, if she has any time left, helps her husband in the fields. I knew she would be hard to sell, but I went in and asked her to come out to my trailer and see a modern kitchen. I knew better than to ask her to come out to see a stove because I knew she would refuse. I told her I had something that would give her some time to help the old man in the barn and save her time. She said, "Well, if you have something like that, I'm interested. If it's something fancy I don't want it."

I got her out there and demonstrated the stove with an aluminum kettle of water, and had the water boiling in a few minutes. She asked me the price of the stove. I told her she wasn't interested in the price of the stove, what she was interested in was how much work and time she could save with this stove. I finally sold her a $125 range. She had a $25 one in mind when I started talking to her.

Another point to remember is this—don't sell the customer something he doesn't need, because nine times out of ten the merchandise will come back. You must study the customer's needs before you sell him.

In closing, I would like to read you this parable:

And in those days, behold there came through the gates of the city a salesman from afar off, and it came to pass, as the day went by, he sold plenty. They that were the grouches smiled on him and gave him the hand that is glad. The tightwads opened their purses to him.

And in that city were they that were the order takers and they that spent their days in adding to the alibi sheet. Mightily were they astonished. They said one to another, "How doth he get away with it?" And it came to pass that many were gathered in the back office and a soothsayer came among them. And he was one wise guy. And they spoke and questioned him, saying, "How is it that this stranger accomplisheth the impossible?"

Whereupon the soothsayer made answer:

"He of whom you speak is one hustler. He ariseth very early in the morning and goeth forth full of pep. He complaineth not, neither doth he knock. He is arrayed in purple and fine linen while ye go forth with face unshaven and pants not pressed. While ye gather here and say one to another, 'Verily, this is a terrible day to work,' he is already abroad. And when the eleventh hour cometh he needeth no alibis. He saith not to the mass, 'Behold, they that are in this town, they are a bunch of boneheads.' Nor doth he report that they cannot be sold.

"He knoweth his line and they that would stave him off, they give him orders. Men say unto him, 'Nay, nay,' when he cometh in, but when he goeth forth he hath their names on the line that is dotted.

"He taketh with him two angels—Aspiration and Perspiration. He knoweth whereof he speaketh and he worketh to beat —. Verily, I say unto you, go and do likewise!"

NOTES

Northwestern Blaugas Co., of St. Paul, reports that the consumption of its liquefied petroleum gas, used beyond city mains for any purpose where heat is required, has increased 100 per cent for every one of the last 10 years.

W. W. Overman, of Kansas City, assistant salesmanager of Skelgas, recently addressed a meeting of 40 company dealers at Bemidji, Minn. Other speakers were R. H. Stinger, district manager at Bemidji, and R. Gunderson, company representative from Kansas City. Skelgas dealers in Northern Minnesota were told that provisions have been made for a doubling of merchandizing facilities.

W. H. Peters, manager of the Rockgas & Appliance Co., of Vista, Calif., has rearranged his delivery service so that his trucks can travel different pre-arranged routes every day. Customers are informed of the schedules and thus can more nearly anticipate their requirements. The territory is a large one, covering both San Diego and Orange counties.

Farmers-Merchants Skelgas Co., E. A. Meester, manager, held its formal opening April 13 in Rock Rapids, Iowa. A full line of gas stoves and other household appliances suitable for use with liquefied petroleum products was on display.

Philgas dealers and salesmen, 150 strong, serving in the tri-state territory served by Philgas through the Worthington Gas Co., met in Worthington, Minn., April 14, for a banquet. Service problems and sales plans were discussed.

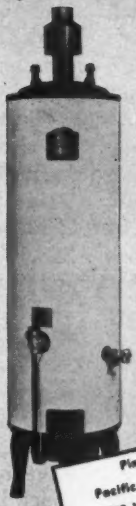
Ruttger & Harris, Pyrofax Gas distributors, of Crosby, Minn., held cooking school sessions in May in Crosby to better acquaint local residents with the uses of liquefied petroleum gases for domestic purposes and to introduce advantages of new appliances. The school was under the direction of Olga V. Hanscomb, food specialist, of St. Paul.

TO OUR READERS

BUTANE-PROPANE *News* is interested, and its readers are interested, in the activities of every dealer and distributor. We earnestly solicit them, from any and from all of our readers, news stories and short articles dealing with the every-day progress of your company. If you are planning a new sales campaign, if your company has appointed a new manager, if you are thinking of extending your service to an unserved community, the readers of BUTANE-PROPANE *News* would like to hear about it. Please send us the facts — we would like to have photographs too. Just jot down the accurate details in a short letter, enclose the photographs in an envelope with cardboard backing, and mail to BUTANE-PROPANE *News*, 810 South Spring St., Los Angeles, Calif.

PACIFIC

"THE LINE OF LEAST RESISTANCE"



Punch up your Appliance Sales! Cash in on Pacific's amazing fuel economy... scientifically designed Multi-Tubular Burner... highest possible efficiency rating... *more heat with less fuel.* Write for catalog... or mail the coupon NOW!

Pin to your letterhead . . . Mail today.

Pacific Gas Radiator Co. (Dept. BN6)
1740 W. Washington Blvd., Los Angeles
Send complete literature and prices on—

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Name.....

Company .....

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26 SUCCESSFUL YEARS

. . . and still growing!

Specify *Pacific*

for maximum efficiency from Butane or Propane fuel

Butane Gas Plant Serves High School For All Cooking and Heating Requirements

By SHERMAN H. FREEMAN Superintendent, Vista, California, Unified School District

THE Vista, Calif., high school butane gas plant, a full automatic and self-balancing unit, has been in operation since September, 1938, and the results are considered very satisfactory in spite of inexperience in the operation of such equipment. The installation was made by Butane, Ltd., of Los Angeles and San Diego, Charles W. Wright, consulting gas engineer.

The plant stores 3000 gals. of butane, equivalent to 600,000 cu. ft. of 525 B.t.u. gas. The heat exchanger capacity is approximately 2000 cu. ft. per hr. of butane gas for a peak load. Gas consumption is low because it operates only when tank pressure drops below 50 lbs. This pressure can be maintained regardless of temperature or normal pressure, a specially valuable feature for cold weather. To illustrate, if the thermometer registered five degrees above zero, and the normal pressure would be 7 lbs., this unit would maintain any pressure desired from 0 to 100 lbs., thereby eliminating any danger of freezing, or pressureless gas in low temperatures.

The plant in the Vista school is independent of any outside source of power or heat. The unit has no float valves, no electrical equipment is required, and there are no "gadgets," the entire installation being controlled with several regulators and a thermostat.

Our space heat and hot water requirements are large, so before making any decision regarding a plant, several other installations were investigated, and final selection was influenced because of the many advantages it offered for space and water heating, simplicity of operation and apparent economy over other methods and kinds of fuel.

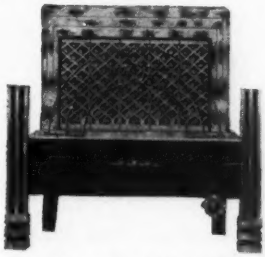
The high school consists of three units, a combination gymnasium - auditorium building, which also houses a cafeteria; a main classroom unit, and two classroom homemaking units, totaling 236,460 cu. ft. of space. All are butane-gas heated.

The space-heating units of "Block A," the gymnasium, have a total input of 512,460 B.t.u. per hr. Those in the main classroom unit, or "Block B," have a capacity of 498,840 B.t.u. The remaining units, "Block C," have a total capacity of 171,000 B.t.u. The space heating units of the entire plant have a capacity of 1,182,300 B.t.u. This load is almost doubled when the water-heating units are in operation.

Besides the space-heating requirements, large quantities of hot water are used in shower rooms, cafeteria and homemaking classrooms. To supply hot water to the two shower rooms, one 42 x 96-in. 608-gal. capacity A.S.M.E. Code hot water tank with quick, clean copper tube heat exchanger was in-

NOW
PEERLESS OFFERS

A Complete Line of HEATING EQUIPMENT Designed for Use on Liquefied Petroleum Gas



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WALL HEATERS

In Sizes and Designs to Suit Any Needs

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7741B
30,000 B.t.u.
Per Hr.

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45,000 B.t.u
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Vented Circulators—Radiant Type
Open Top—With Directional Louvres

ALSO FLOOR FURNACES IN FOUR SIZES

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PEERLESS MANUFACTURING CORP.
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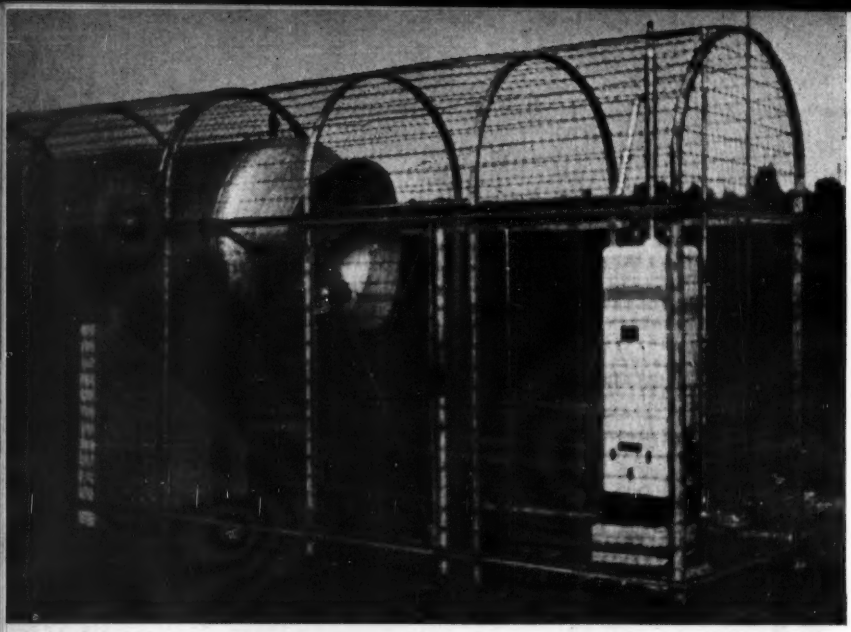

Butane gas storage tank and vaporizer installed in Vista, California, High School.

stalled with an automatic gas-fired steam boiler complete with jacket and controlled with Robertshaw reverse action thermostat, thermometer, and vent valve. The cafeteria is served by a 55-gal. full automatic water heater, as is the homemaking classroom. Two 20-gal. heaters serve two toilet rooms.

The past winter has been one of rather extended cold weather, requiring heat and hot water for longer periods than normal; the gymnasium has been used for evening classes and gatherings as well as in the daytime, with an additional use of water for showers; the cafeteria has served both elementary and high school pupils, the noon number being from 300 to 400; the kitchen is frequently used in the evening, and evening classes have been held throughout the entire school, all constituting an extra heavy load upon the butane gas plant, but even under these extreme conditions the installation has had more than sufficient capacity to care for heating and hot water needs.

To date we have received five deliveries of butane, or a total of 11,339 gals. of gas, and there is a quantity remaining on hand that will probably carry over into the fall of this year.

■ ■

W. P. Hutchinson Dies

W. P. Hutchinson, president of the Sprague Meter Co., Bridgeport, Conn., passed away on Sunday, May 21. This message was received just as BUTANE-PROPANE *News* was going to press.

Mr. Hutchinson had been prominent in the gas industry for more than 25 years.

■ ■

Demonstrates Flamo Kitchen

To acquaint the women of Waterville, Wn., with the practical value of "Flamo," the Standard Oil Co. gave a demonstration there on May 22-24 of a kitchen fully equipped to use liquefied petroleum gas.

MAIL THIS COUPON for RUUD Butane-Propane Information

RUUD MANUFACTURING COMPANY, Pittsburgh, Pa.
SEND THE FOLLOWING:
.....Ruud catalog for butane-propane gases.
.....Complete prices on the Ruud line.
.....Ruud advertising portfolio.

Company Name.....

Address.....

City.....

Your Name.....

Mail the coupon for full information on the finest and fastest-selling line of gas water heaters made! . . . RUUD! Mail the coupon to know how much RUUD can help you make money selling water heaters! Mail the coupon to learn all about the nationally advertised Ruud Automatic Water Heater with the 20-year guaranteed Monel tank! Mail the coupon! No red tape! No obligation!

RUUD MANUFACTURING CO.

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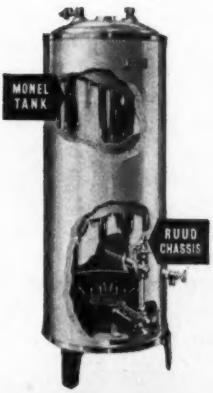


RUUD AUTOMATIC WATER HEATERS WITH MONEL TANKS . . . RUUD AUTOMATIC WATER HEATERS WITH NEW-PROCESS, SUPER-WEIGHT GALVANIZED STEEL TANKS . . . RUUD CABINET AND TABLE-TOP MODELS . . . RUUD VOLUME AND COMMERCIAL WATER HEATERS . . . RUUD HAND-FIRED WATER HEATERS.

• • • •

ALL MODELS OPERATE ON ALL TYPES OF LIQUEFIED PETROLEUM GAS . . . COMPLETE SIZE AND PRICE RANGE . . . NATION-WIDE SYSTEM OF BRANCHES . . . COMPLETE ENGINEERING AND ADVERTISING ASSISTANCE.

Metering

What One Company Is Doing Towards Equalizing the L.P.G. and the Metropolitan Utility Services

By GEORGE A. BURRELL

President, Atlantic States Gas Company, Inc.

THE comparative merits of weighing versus metering methods of dispensing liquified petroleum gases to dealers and consumers is constantly under discussion among the trade. Early practice, still predominating, called for weighing, as it permitted extensive distribution of bottled gas with a minimum of investment, with collection in advance for the gas. Thus a dealer is enabled to carry on a small distribution business with limited capital, or even as a side line to his hardware store, plumbing or other business.

Of course, the same method was and is still conducted by larger companies, so that with more capital and more vigorous sales cultivation of an area, they serve from say, 1000 to 8000 customers, secured in say five to 10 years time, and over areas of 35 to 45 mile radius. An elaboration of the scheme consists in the delivery of only one cylinder of gas and its replenishment from a gas tank truck, the cylinders being weighed by means of a scale on the truck. A more recent step has to do with the metering of some of their loads by these same companies and the burying of some of their tanks underground, so that different practices may be employed by the same companies.

Of course, as the industry has developed there has occurred a drive for more and more customers and larger gas consumption per customer. Prices for bottled gas service equipment have come down, in the main, from well over $100 through various levels to the now more or less standard price of $9.75, originally set by the Phillips Petroleum Co. in order to seek lower economic levels of customer, and to thwart competition. But this practice is not standard the country over. Witness the price of the American Gas Service Co. of $139.50, and even higher prices of other companies.

There is a wide range of gas rates, depending upon the load and upon the individual companies and other practices of those companies, but the tendency, just as in the case of the price of equipment to customer, is downward, to secure more customers, and to meet or excel competition.

My own company meters gas to its customers as part of a gas service which we aim to make the equivalent of city gas service. Hence, the customer pays for the gas each month after the gas is used and the meter read. We feel, too, that the public can more readily reconcile itself to meter-

BOTTLED GAS CONTROL

PERFECT REGULATION

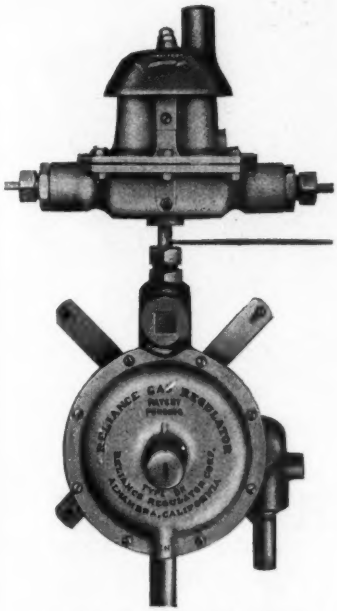


Fig. 1. Type "MR" Spring Loaded Canopy Top Primary Regulator and Type "BK" with Bracket and Mercury Seal as Secondary Regulator.

Fig. 2. Indicator Dial.

Reliance manufactures a complete line of gas regulators for Butane, Propane, Manufactured, Natural and Mixed Gases. Various types for liquid petroleum gas service have been thoroughly tested and approved by the National Board of Fire Underwriters. Reliance Type "MR" primary regulators reduce variable cylinder pressures to a uniform outlet pressure of from three to ten pounds. When installed with two or more cylinders, the "MR" will automatically draw on one or more, depending upon the load and generating ability of the cylinders. Type "MR" regulator is usually installed in combination with Type "BK" or "BKR" secondary regulator, which further reduces the three to ten pounds pressure to the required inches of water pressure for proper utilization. The Type "MC" is available as a larger unit designed for greater capacity than obtainable with the "MR" type.

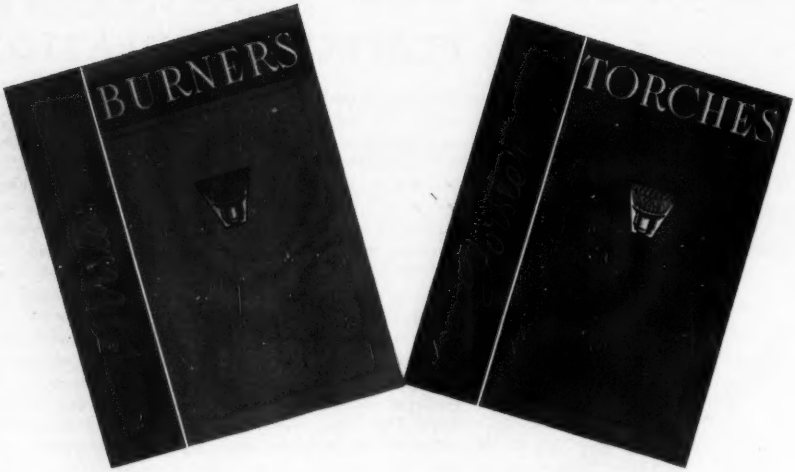
An indicating device with a movable pointer shows the customer the operation of the cylinders, and when the pointer is at service indication on the dial, he knows that a reserve cylinder is standing in readiness to operate. When the service cylinder is depleted, the outlet pressure of the primary regulator is lowered automatically and, due to this change, causes the indicator pointer to swing to reserve, telling the customer of this fact and warning him to order an additional supply. Reliance controls the patents (1960466) on this type of equipment exclusively.

Reliance Type "BK" and "BKR" regulators are separate units that can be used individually as single step reducing regulators, with the use of manual control valves; or they can be used as secondary regulators with "MR" primary regulators, giving two-step reduction of pressures, which insures full automatic control and renders a service as constant and dependable as any manufactured or natural gas company can offer its customers. Internal mechanical relief valves or mercury seals can be provided for the "BK" regulator as desired.

SEND FOR BULLETIN No. 40

RELIANCE REGULATOR CORPORATION
1000 MERIDIAN AVENUE ALHAMBRA, CALIFORNIA

R E L I A N C E



Get These Catalogs

Between the covers of these two books is a compendium of information on many types of torches and burners for the safe and efficient combustion of butane, propane, natural and manufactured gases.

These two catalogs should be in the hands of every one who is a user of any of these fuels, or who sells and installs industrial, commercial and domestic heating apparatus. Write for your copies today.

We are prepared to design and install industrial butane standby plants, public service gas plants, as well as automotive and stationary engine conversions. Your inquiries are solicited.

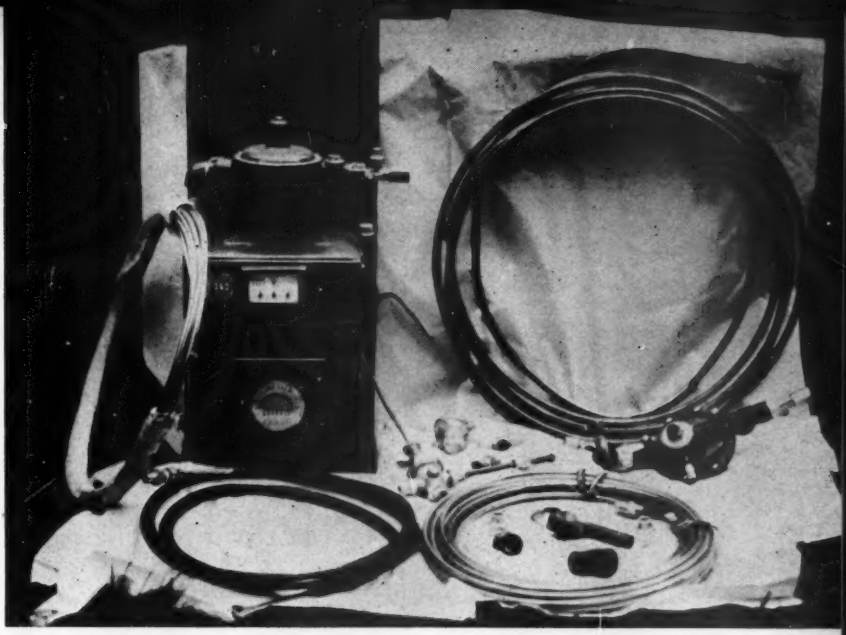
RANSOME COMPANY

Manufacturers of Forster Torches and Burners

4030 Hollis Street

EMERYVILLE, CALIFORNIA

RANSOME



Complete meter and line assembly showing meter, low and high pressure regulators, fin tubing, different sizes of copper tubing and fittings.

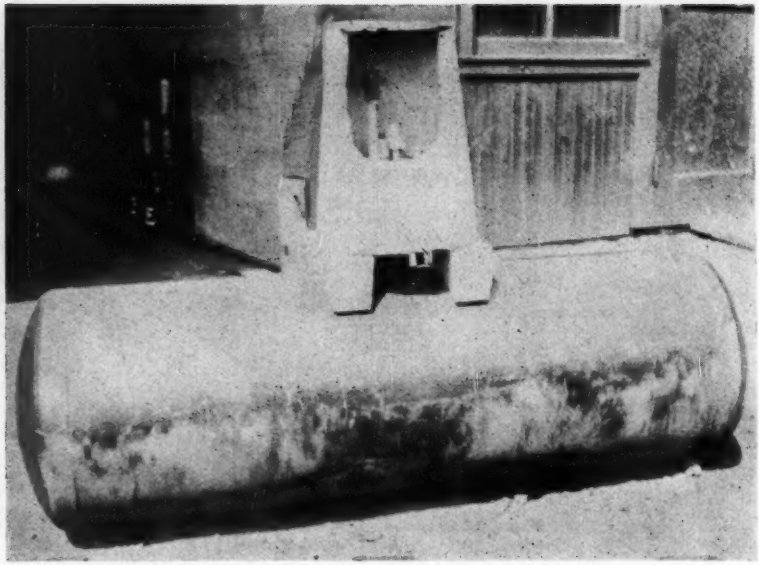
ing gas from the long history of the meter in the gas business. For the same reason we prefer to sell our gas on a cubic foot basis, rather than on therms, or some other designation. It is readily understood by the customer.

Further, just as in the case of city gas service, we have different specialists and crews for specific operations. Certain crews do nothing but make new installations, others only read meters, and make collections, others only service appliances, and billing clerks make out the bills, and special collectors contact delinquents.

A large tank, buried underground, reduces deliveries of gas by tank truck to the average of once each six months per customer, although this may range from once in less than a month to once in one and one-half years, depending on the gas load.

Of course, this calls for more capital investment and the carrying of a large gas inventory, but it is all part of a drive to increase customer saturation in an area, and along with moderate gas rates, to increase gas consumption per customer. Our consumption is of the order of 200 gals. of liquid gas per customer per year, compared to the usual consumption of 100 gals. Our rates have resulted in a large water heater, refrigerator, commercial, and some industrial loads, so that we have a very considerable gas load in a variety of appliances.

Just what saturation we can expect I do not know, but in a few villages of the more prosperous sort, and under the stimulus of an excellent salesman, it has reached 25 to 40 per cent of the possible customers. In other areas, of low purchasing power, a poor sales



Rust-proofed 125-gal. consumer's tank with pre-cast cement curb box, cut away to show quick filler valve and top of measuring gage.

effort, or both, the saturation is negligible.

Our meters are mainly of the 100,000 cu. ft. dial size. I have at hand a study of 2500 of them by us. Twenty-five of them were removed from service. Of these 12 developed leaks after having been in service, four did not register, five had broken glass, either broken in shipment or service, and four were removed because customers claimed that they did not register correctly. But of 31 tested for us by the American Meter Co., only one proved to be slightly off.

Cost of repairs of meters have been negligible, and whenever necessary the American Meter Co. has paid the bill except for breakage by our customers or ourselves. Meter diaphragms are treated with special material.

Undoubtedly a study similar to the above, if made now by us, would show even better results than the foregoing, for our men are more experienced now in handling equipment, and I suppose our customers have less curiosity about the inside of the meters and their youngsters have discovered that the glass really will break if struck a hard enough blow.

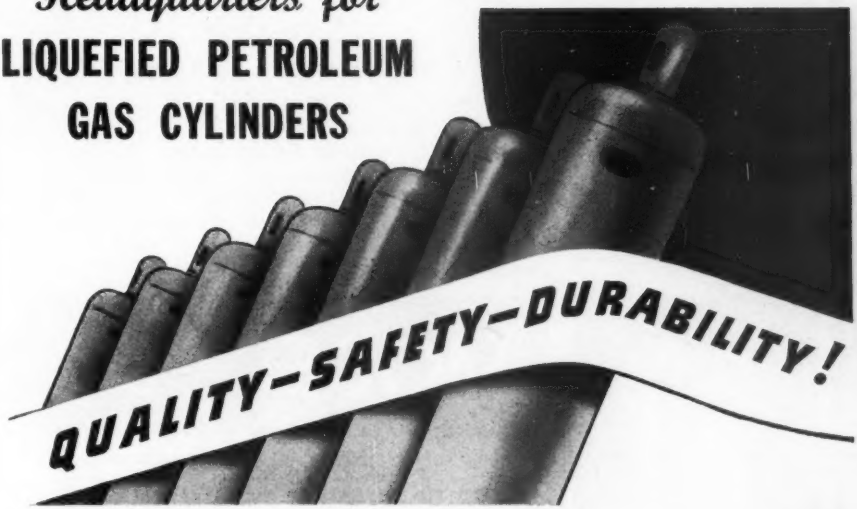
As regards scales, one company using a beam scale of 350 lbs. capacity has found that the average gross weighing error is from plus one-half per cent to minus one-half per cent. The consumption error would therefore be less than this. Scales are checked weekly and go back to the maker each 12 to 18 months for repairs costing $25 to $30.

An accuracy of two per cent either way is generally accepted in meters.

SCAIFE

Headquarters for

LIQUEFIED PETROLEUM GAS CYLINDERS



Keeping pace with the rapidly expanding butane-propane markets, the mounting sales of Scaife Cylinders reflect more strongly than ever the esteem in which the industry holds this premier product.

Built for the *service* you need and demand—of uniformly-dimensioned, carefully selected material—by master craftsmen employing the most modern methods and equipment—conforming in every respect to I.C.C. regulations—each Scaife Cylinder supplies the reasons for making SCAIFE your one-word gas cylinder specification!

WM. B. SCAIFE & SONS CO.

(FOUNDED 1802)

General Offices,
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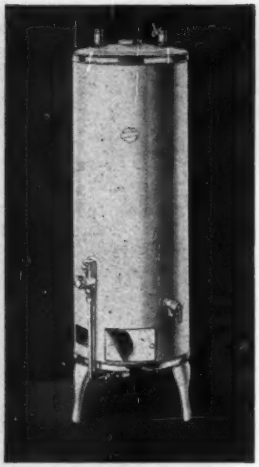
Oakmont, Pa.
(Pittsburgh District)

Representatives
in Principal Cities

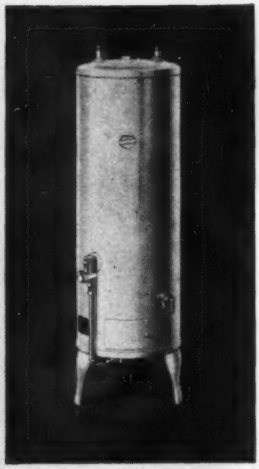


MODEL "C"

Real Water Heating Service at Low Cost

A.G.A. Approved for PROPANE Fuel

● Extra heavy welded supply tank with heavy top, bottom and central heating flue. Snap acting thermostat. Safety control. Noiseless "Star" Burner. Special flue baffle. Heavy insulation. Full baked enamel, cream or white finish. Stainless steel trim. Backed by factory two year guarantee.



MODEL "D"

Popular Low-Priced Heater

Automatic Storage

5 Sizes — 15 to 50 Gallons!

● Many features found only in higher priced models. Electrically welded tank. Central heating flue. Snap acting thermostat. Quiet, efficient burner, especially designed for propane and butane fuel. Heavy insulation. Full baked enamel—Cream or White. Backed by factory guarantee.

Complete Laboratory Facilities Available For All Dealers
Let us help you solve your Butane-Propane Problems

Write for complete Catalog and Sales Manual

MERIT WATER HEATER CO.

COMPTON CALIFORNIA

PRODUCTS

Rego KX Torch

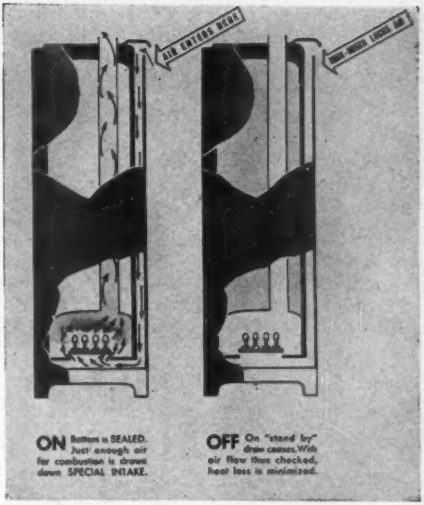
Bastian-Blessing Co., Chicago, Ill.

Model:

Rego KX Torch. (a) 19″x26″ length; (b) 75° or 90° head angle; (c) two positions of high pressure valve levers, bottom and side; (d) three complete series of tips, each with correct varying amount of pre-heat hole area.

Description:

For tough cutting in such operations as hole punching, cutting, rusty multiple plates, deseaming billets, cutting heavy sections. Stainless steel head withstands terrific heat without distorting; does away with stripped threads. Stainless steel tubes in triangular construction with welded spacer give maximum strength and added rigidity. High pressure valve accurately constructed; diaphragm in valve eliminates customary packing; assures leakproof operation, long handle provides maximum leverage, gives sensitive control. Forged brass body incorporates shut-off valves that have large easy-grip wheel handles with pressure-fitted monel stems. Solid-drawn copper tips give ideal gas mixture with faster pre-heat.


AIR ENTERS HERE
ON Bottom is SEALED. Just enough air for combustion is drawn down SPECIAL INTAKE.
OFF On "stand by" draw ceases. With air flow thus checked, heat loss is minimized.

Crane Superior Heater

Bastian-Morley Co., Inc., LaPorte, Ind.

Model:

Crane Superior with Mini-Miser. Approved by A.G.A. for L.P.G.A. service.

Description:

Equipment includes standard features for all types of gas fuels at no extra charge. A new principle of air control, for which a patent has been applied, is known as the Mini-Miser because it minimizes heat loss and is a miser on gas cost. The Mini-Miser regulates air flow, giving the heater just enough air for combustion when the burner is on, and checks air flow when the burner is off. Intake of air needed for combustion is at the top of the heater instead of at the bottom. When the burner is off, which is approximately ¾ of the time, an air lock is created. Cold air is locked out and heat loss is minimized. The entire base of the heater is closed. Other new features are: a 5-in-1 thermostat which includes gas filter; built-in gas flow adjustment; main shut-off valve; safety push-button control (main burner cannot be turned on until the pilot is lighted); a new electro-magnetic gas shut-off, which shuts off the gas supply if the pilot should be extinguished; an insulated, plug-type combustion chamber door that protects the exterior finish

against discoloration; 2½ in. of Heatseal insulation is in this unit. If desired, the Geyser principle of heating can also be had in the 1939 Superior with Mini-Miser.

■ ■

Granberg Rotary Pump

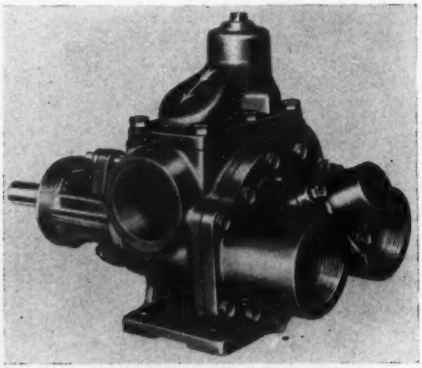
Granberg Equipment, Inc., Emeryville, Calif.

Model:

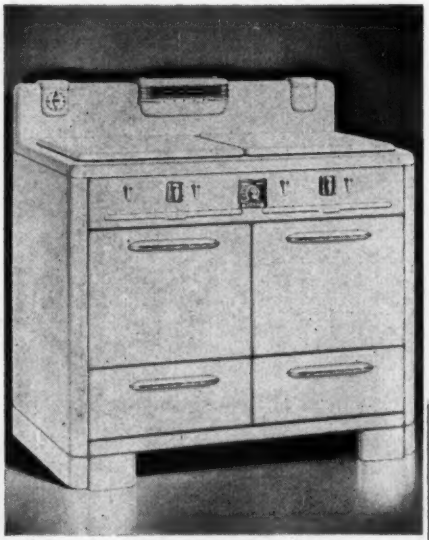
Granberg Rotary Pump.

Description:

Specially designed for use in butane and propane service and is equipped with safety valve, alloy housing, lubricated packing gland, outboard ball bearing, solid bronze rotor and bronze fittings. While designed to withstand any line pressure that may be encountered in the butane field, the unit is not represented as a high pressure pump. Housing of the new pump is of special iron alloy, approved by the California Industrial Accident Commission. The safety valve, which is factory-set at 150 lbs. unless otherwise specified, is so mounted on the pump as to relieve pressure when valves are closed on both sides of the pump. The relief valve is quiet and chatterproof and



is easily adjusted in the field. Factory setting on valve gives pump a differential pressure of 40 pounds. The packing gland is equipped with a device by which lubricant can be injected to revive the packing without having to remove packing or gland and designed to prevent lubricant from becoming emulsified with the butane in the pump. This gland is rigidly supported and aligned with the outboard ball bearing, which is integral with the pump and permanently sealed with lubricant. Bearings are of size adequate to withstand the severe serve of moving liquefied petroleum gases. The rotor is designed on the exclusive Granberg principle, extremely positive in displacement and very smooth in delivery. The pump is quiet, light in weight, has dry suction, works equally well in either direction, and produces a minimum of turbulence in the pumped liquid.



Super Deluxe "Sheffield" Roper

George D. Roper Corp., Rockford, Ill.

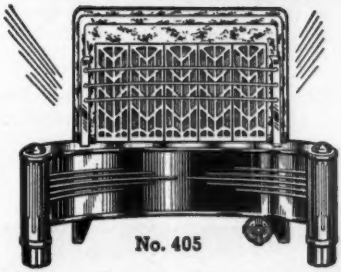
Model:

1939 Roper Sheffield No. 7420. Approved by A.G.A. for L.P.G.A. service.

Description:

Four burners—one giant simmer speed and three simmer speed burners; air stream cooking top; two enamel burner trays; thermal eye oven control; large super insulated three-in-one oven; extra large, handy, high Astogril roll broilers; two super speed low temperature oven burners; turret top; lifetime cooking chart; large roll drawers; distinctive crockery condiments and timer alarm.

HUMPHREY
Quality Appliances for
BUTANE · PROPANE



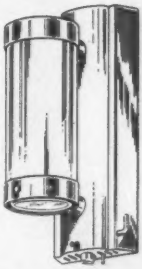
No. 405

New modern Radiantfires provide a valuable medium for the sale of Butane or Propane Gas.

The HUMPHREY OPALITE

No. 1

Lighting with gas becomes modern and popular with these new Humphrey Opalites. There's all the comforting brilliance of daylight without glare.



JUNIOR OPALITE

For lighting smaller areas this modern wall lamp is recommended. Send for complete information on all Humphrey Butane and Propane Gas appliances.

GENERAL GAS LIGHT CO., Kalamazoo, Mich.

ENSIGN

BUTANE-PROPANE CARBURETION EQUIPMENT FOR TRACTORS - TRUCKS - BUSES

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DISTRIBUTORS FOR FORSTER TORCHES AND BURNERS FOR USE WITH BUTANE-PROPANE GAS AND NATURAL GAS . . .

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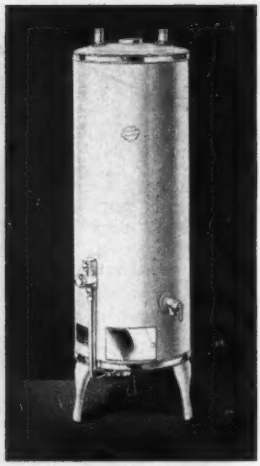
LOS ANGELES · DALLAS · CHICAGO



Merit Water Heater

Merit Water Heater Co., Compton, Calif.

Model:

C. Approved by A.G.A. for L.P.G.A. service.

Description:

Features include proper location of large star burner in relation to bottom of tank; a baffle especially designed for heavy gases; proper location of the orifice in relation to mixer throat for high primary air injection; elimination of all on and off burner noise by use of 180 No. 45MTD ports in burner head; 100 per cent automatic safety device which closes off burner and pilot when pilot is extinguished. Heaters are finished in baked enamel in white and in ivory.

■ ■

Detroit Jewel-Garland

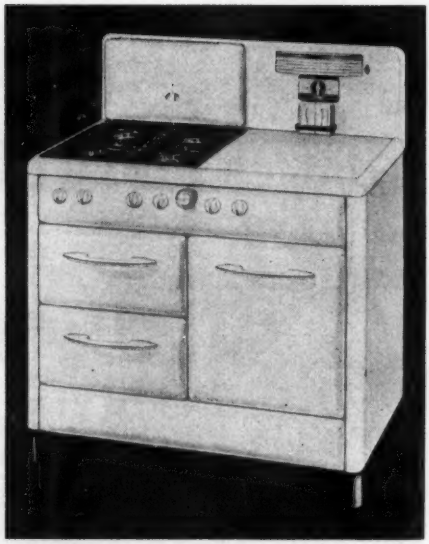
Detroit-Michigan Stove Co., Detroit, Mich.

Model:

Detroit Jewel No. 69039 or Garland No. 39039. Approved by A.G.A. for L.P.G.A. service.

Description:

Regular equipment includes Flex-heet top burners; click-simmer valves for all top burners; chrome burner pans around top burners; porcelain top grates; flush cooking top; folding cover top over top burners; automatic top lighter; Even-Temp oven, full size, one-piece, porcelain finish; extra heavy insulation for oven; sanitary oven tray; oven heat control; safety stop oven racks; Fla-Ver Seal broiler, elevated drawer type, on ball-bearing rollers; porcelain broiler pan (elevated) and porcelain smokeless grill; large utility drawer; recessed base; condiment set; de luxe hardware; range finished in white-and-black porcelain, with base in black gloss ebonite; high quality construction; lamp and manual time reminder. Extra equipment at extra cost; Multi-Temp top burners, including one giant burner; chrome broiler grill; chrome broiler pan; automatic lighters (gas type) for main oven and elevated broiler. When liquefied petroleum gas is to be used specify letter "B" and give trade name of gas.



Dimensions (inches):

Floor space required, 39x29; baking oven, 16x20x13; broiling oven, 15⅜x20x7½; height of cooking top, 36; top over all, 38¾x23⅝. Shipping weight: 325 lbs.

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An efficient and economical method of insuring continuous production of Propane Butane Gas of uniform rating. Gives positive warning of low or too high B.T.U., low vapor temperature, and other plant difficulties whenever they occur. Saves money by holding B.T.U. within small limits. A low-cost, dependable system that meets every requirement with the utmost efficiency, providing constant control of production conditions.

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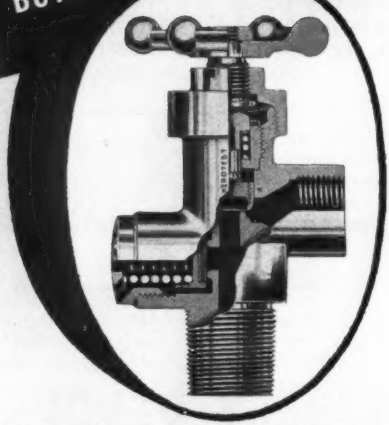
CYLINDER VALVES
DESIGNED ESPECIALLY FOR
BUTANE-PROPANE GASES



Thoroughly proved by years of service, these famous Kerotest Diaphragm Packless Valves are designed with an exclusive automatic spring relief type of safety device so designed that only excess pressures caused by increased temperatures or overloading are released.

This positive safety device eliminates the use of fuse plugs and is set to operate at a pre-determined initial leak pressure, the setting for which is stamped on the adjusting cap.

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Pacific Coast Section of L.P.G.A. Names Committees

AT THE open meetings on April 23 in Los Angeles, and April 25 in San Francisco, the members of the Pacific Coast Section of Liquefied Petroleum Gas Association, Inc., expressed themselves as favoring the selection of standing committees to carry on the various functions of the organization.

Accordingly, at a meeting in Los Angeles on May 12, of Chairman Gilbert Woodill, Secretary L. C. Roney and several members, the following committee chairmen were named, they to serve in their respective positions throughout the remainder of this year:

Regulations—Turner C. Smith, General Petroleum Corp.

Membership—R. J. Richards, American Liquid Gas Corp.

Advisory to Chairman and Secretary— T. H. Ransome, Ransome Co., J. T. Joplin, Butane Corp., C. L. Parkhill, Parkhill-Wade.

Enforcement of Regulations—C. L. Parkhill.

Tanks—Oliver W. Kilham, American Pipe & Steel Corp.

Advertising, Education and Legal Matters—F. O. Olmstead, Union Oil Co.

Insurance—L. A. Schloss, Ransome Co.

Gases—Storage and Transportation—F. S. Burt, General Petroleum Corp.

Appliances—W. H. Tappan, Tappan Stove Co.

Equipment and Systems—George R. Friederich, Fisher Governor Co.

Among the important and immediate duties of the Committee on Regulations will be to work with the Industrial Accident Commission to revise, clarify and strengthen the Commission's liquefied petroleum gas orders and/or to adopt the N.B.F.U. Pamphlet No. 58 and Motor Fuel Regulations Part 2 thereof.

Ratification by Association members of the Regulations Committee's report will be asked in an unscheduled future meeting.

■ ■

Firemen Discuss Safety

The Fire Engineers' Division of the Northern California Fire Chiefs' Association held its April meeting in Richmond. Regulations concerning liquefied petroleum gas installations were discussed.

Geo. P. Bunn Made President of Natural Gasoline Assn.

THE election of George P. Bunn as president and the selection of other new officers for the ensuing year highlighted the annual three-day convention of the Natural Gasoline Association of America, held in Tulsa, Okla., May 2-5. Mr. Bunn, manager of the gas and gasoline departments of Phillips Petroleum Co., succeeded J. A. LaFortune, of Warren Petroleum Corp., who completed his second term as president.

G. P. BUNN

Vice-presidents elected were Ray E. Miller, of Hanlon-Buchanan, Inc.; J. R. Jarvis, Lone Star Gasoline Co.; and J. W. Vaiden, Skelly Oil Co. Mr. Miller and Mr. Jarvis were re-elected to their positions. William F. Lowe is secretary-treasurer.

Of outstanding interest, also, was the selection of George G. Oberfell, vice-president of Phillips Petroleum Co., as the recipient of the Hanlon Award, the complete story of which appears in this issue of BUTANE-PROPANE *News*, page 17. The Hanlon Award is open to members of the liquefied petroleum gas industry by virtue of an invitation extended to the L.P.G.A. through its new president, J. Woodward Martin.

■ ■

L.P.G.A. Southern Group Meets in New Orleans

It has been decided to hold a sectional meeting of the Southern section of the Liquefied Petroleum Gas Association on June 22-23 at the Roosevelt Hotel in New Orleans, according to F. R. Fetherston, secretary of the national association.

Up to the time of BUTANE-PROPANE *News*' going to press, no program had been released but it is known that there will be featured exhibits of liquefied petroleum gas systems, appliances, and other devices.

The meeting will be attended by officials of the Southern states who will discuss the various problems that affect the industry.

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RESEARCH

• **BUTANE-PROPANE** *News* **wishes to keep its readers informed regarding technical and practical advances concerning research, manufacture, development, and transportation in the liquefied petroleum gas field. In this column will be found a resume of recently published articles, papers, bulletins and books dealing with the industry's various phases.**

Report of Investigations 3429, Bureau of Mines; Cooperative Fuel Research Motor-Gasoline, Summer 1938—E. C. Lane. This report covers 54 brands of gasoline represented by 1480 samples, plus those from the Pacific Coast, averaged by the Pacific Coast Technical Group. Characteristics of regular-price, premium-price, and third-grade motor gasolines are reported, based on inspections made in oil company laboratories.

The Compressibility of an Equation of State for Gaseous Normal Butane—James A. Beattie, Gerald L. Simard and Gouq-Jen Su. *Journal American Chemical Society*, Jan., 1939, pp. 26, 27. The compressibility of gaseous normal butane has been determined over the temperature range 150° to 300° and from a density of 0.5 to 8.5 moles per liter. The values of the constants of an equation of state are determined from the data for densities less than the critical (3.88 moles per liter).

Gas Carburizing with Pure Propane—Fred P. Peters and M. G. Farrar. *Metals and Alloys*, Jan., 1939, pp. 13-17. Case-hardening—or more specifically, carburizing—is one of the oldest, most useful and least standardized of the metallurgical arts. As to the particular kind of gas to use for carburizing, pure propane offers distinct advantages of excellent, controllable case properties and absolute case uniformity that merit wider consideration. Describes use of this gas, equipment used, etc.

Permeability of Neoprene to Gases—Theron P. Sager and Max Sucher. *Journal of Research*, National Bureau of Standards, Jan., 1939, pp. 71-79. The specific permeability of Neoprene to hydrogen, helium, and carbon dioxide at 25° C. is shown to be about one-fifth to one-sixth that of rubber. Permeability is inversely proportional to the thickness of film. The increase in the rate of permeation of hydrogen with temperature is shown to be exponential, since, when log permeability is plotted against reciprocal of absolute temperature, straight lines are obtained. Various factors regarding the behavior of coated fabrics are discussed. Moderate amounts of the usual compounding ingredients do not appreciably affect the rate of permeation. The use of highly volatile solvents in spreading cements tends to produce pinholes. Toluol, or its equivalent, appears to be the most satisfactory solvent.

Low Temperature Hydrometer Method for Liquefied Gases—W. H. Schaufelberger. *Oil and Gas Journal*, Feb. 2, 1939, pp. 37, 38. Specific gravity determination on liquefied petroleum gas stocks have been run with a bomb. This paper covers the development of a rapid method for making specific gravity tests with a hydrometer.

Special Vapor-Pressure Bomb for Demonstration of Vapor-Liquid Relationships—J. A. Campbell. *Petroleum Engineer*, Feb., 1939, pp. 51, 52, 54. This article clarifies some points that puzzle some of the men who use the Reid Vapor Pressure Bomb in gasoline plants and refineries.

Stainless Steel for Welded Pressure Vessels—George A. Sands. *Iron Age*, Feb. 9, 1939, pp. 38, 39. The development of stabilized austenitic chromium-nickel stainless steels has broadened the use of these steels for welded pressure vessels. The problems of quenching and stress relief are simplified by stabilizing the low-carbon austenitic stainless steels with the addition of less than one per cent of columbium or titanium. This material is very useful for all-welded tank car construction.

Air Conditioning—Charles R. Downs. *Industrial and Engineering Chemistry*, Feb., 1939, pp. 134-140. First in a series on this subject. Later papers will contain technical information covering various phases of the development.

Handbook Butane-Propane Gases. 2nd Edition (revised Nov., 1938). Published by Western Business Papers, Inc., 810 S. Spring St., Los Angeles, Calif., 415 pages. Contents: Semi-Bulk Distribution; Use of Butane in Buses; Combination Propane Operated Utility Plant; Use in Internal Combustion Engines; Design and Installation of Storage; Supply from Petroleum Refineries; Engineering Data on the Lower Olefins; Domestic Appliance Testing and Utilization; Economical Comparisons with Coal, Oil, Electricity, Producer Gas, Manufactured Gas; Town Plants; Manufacture from Natural Gas; Special Uses; Volume Correction Factors; Transportation; Use with Other Gases; Analysis & Testing; Properties of Mixtures; Bottled Gas Distribution; Bibliography; Central Plant Directory; Catalog Section.

Flame Hardening Applications — John Sheppard. *Welding Engineer*, Jan., 1939, pp. 21-24. This method has several advantages over other methods of surface hardening. Describes types of steels which can be flame hardened and specialized equipment.

Welding Handbook, 1938 Edition, published by the American Welding Society. This, the first edition of the *Welding Handbook*, is offered to the metal industries in response to a demand for practical, up-to-date information, in concise form, on the subject of welding. The volume covers, first, the fundamentals of the various processes; second, the materials used and the testing methods involved; and third, the applications thereof. The handbook is supplemented by data on metal cutting and a number of processes allied to welding and cutting.

Properties of Air-Vapor Mixtures Interpolated to Tenths of a Degree— William Goodman. *Heating, Piping and Air Conditioning*, Feb., 1939, pp. 86-88. Part 2. Continuation of tables started in the January issue. From Tables 3 and 4 can be computed very quickly the *actual* enthalpy (total heat) of an air-vapor mixture if its dry bulb and dew point temperatures are known. A complete discussion was given in the January issue of the method of using the actual enthalpy of the air for accurate computations.

LANCASTER BUTANE-PROPANE STORAGE TANKS

For Both Underground and Above-Ground Service, For Both Domestic and Commercial Use

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18,000 Gallon Water — 15,000 Gallon Liquid Propane Capacity Storage Tank 8' 2¼" diameter and 50' 5¼" long; 200 lbs. per square inch working pressure.

Qualified to manufacture pressure vessels in accordance with the ASME code; API-ASME Committee, Department of Public Safety, Commonwealth of Massachusetts; and National Board of Boiler and Pressure Vessel Inspectors.

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Growth of L. P. Gas Industry Revealed By Government Census Figures

THE Department of Commerce, Bureau of Census, Washington, D. C., in a 1938 report recently issued by Director William L. Austin, offers extensive data on the growth and development of the manufacturers of compressed and liquefied petroleum gases for the period 1933 to 1937. This information should prove of direct interest to all engaged in the liquefied petroleum gas industry, as it clearly indicates the rapid growth of this comparatively new field.

The last census figures compiled cover operations for the year 1937, but as it is an accepted fact that the industry has expanded since that time, it is probable that the table, brought down to date, would reveal even more notable advancement.

The government report reveals the following statistical data:

Establishments engaged in the production of compressed and liquefied gases reported a moderate increase in employment and considerable increases in wages and value of products for 1937 as compared with 1935, accord-

SUMMARY FOR THE INDUSTRY: 1937, 1935, AND 1933*

	1937	1935	1933	Percent of Increase 1935-1937	Percent of Increase 1933-1937
Number of establishments	$ 356	$ 330	$ 326	7.9	9.2
Wage earners (average for year)[1]	4,655	3,788	2,763	22.9	68.5
Wages[2]	6,590,844	4,408,205	3,154,300	49.5	108.9
Cost: materials, supplies, containers, fuel, purchased electric energy[2]	14,243,865	11,239,281	8,585,707	26.7	65.9
Value of products[2]	56,417,673	42,018,950	32,007,108	34.3	76.3
Value added by manufacture[3]	42,173,808	30,779,669	23,421,401	37.0	80.1

*Because they account for a negligible portion of the national output, plants with annual production valued at less than $5000 have been excluded since 1919.

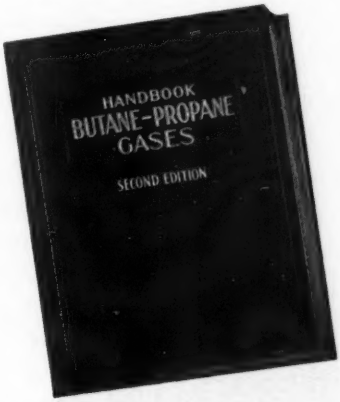
1Not including salaried officers and employees. Data for such officers and employees will be included in a later report. The item for wage earners is an average of the numbers reported for the several months of the year. In calculating it, equal weight must be given to full-time and part-time wage earners (not reported separately by the manufacturers), and for this reason it exceeds the number that would have been required to perform the work done in the industry if all wage earners had been continuously employed throughout the year. The quotient obtained by dividing the amount of wages by the average number of wage earners cannot, therefore, be accepted as representing the average wage received by full-time wage earners. In making comparisons between the figures for 1937 and those for earlier years, the possibility that the proportion of part-time employment varied from year to year should be taken into account.

2Profits or losses cannot be calculated from the Census figures because no data are collected for certain expense items, such as interest, rent, depreciation, taxes, insurance, and advertising.

3Value of products less cost of materials, supplies, containers, fuel, and purchased electric energy.

Handbook
BUTANE-PROPANE
GASES

(Revised November, 1938)



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ing to preliminary figures compiled from returns of the recent Biennial Census of Manufacturers.

The number of wage earners employed in this industry in 1937 was 4655, an increase of 22.9 per cent as compared with 3788 reported for 1935, and wages paid last year amounted to $6,590,844, an increase of 49.5 per cent over $4,408,205 reported for 1935. The total value of the products of the industry for 1937, $56,417,673, exceeded the 1935 figure, $42,018,950, by 34.3 per cent.

This industry, as classified for Census purposes, embraces establishments engaged primarily in the production of gases sold usually in compressed or liquefied form but in some cases (as carbon dioxide for the manufacture of "dry ice" and hydrogen for the manufacture of ammonia and other commodities) delivered through pipes. "Dry ice" also is treated as a product of this industry.

Statistics for 1937, with comparative figures for 1935 and 1933, are given in the following table. The figures for 1937 are preliminary and subject to revision. Detailed statistics on production will be given in a release to be issued later.

■ ■

Revision of California Safety Orders To Be Studied

In San Francisco on May 5 there was held a joint meeting between the representatives of the Liquefied Petroleum Gas Association and the California State Industrial Accident Commission to discuss a proposed revision of the California Commission's safety orders, with a view to coordinating them with the proposed National Fire Protective Association regulations.

Committees will be formed to take up this work and to report back at future meetings.

Blu-Flame Co. Opens New Office in Troup, Texas

Alton A. Ashby, president of the Blu-Flame Gas Co., Inc., announces that his company is now operating in 24 Texas counties and that a new office was recently opened in Troup. Territorial selling privileges have been extended to various members of the present sales organization and unallotted counties will be assigned soon.

Smith and Rusk Counties are covered by C. E. White, of Tyler; Cherokee and Angelina Counties by E. E. Dees; Cass, Bowie and Marion Counties by Homer Brown; and W. K. White has Titus, Red River, Franklin and Camp Counties.

The service department includes John Norsworthy, Clyde Brown and John Henry Foster.

The company emphasizes a free service on liquefied petroleum gas systems to those who buy Blu-Flame gas.

■ ■

John A. Riner Promoted by Spokane United Railways

John A. Riner has been promoted to the position of assistant general manager of the Spokane United Railways, a subsidiary of The Washington Power Co., succeeding R. B. Childs, whose death occurred on last March 31.

Previously Mr. Riner was assistant to Mr. Childs, who converted the company's bus lines to the 100 per cent use of butane fuel in 1934, resulting in Spokane being the first American municipality to adopt liquefied petroleum gas on all its automotive units.

Mr. Riner first became associated with The Washington Water Power Co. in the fall of 1924.

■ ■

Ukiah Lets Butane Contract

The Shell Oil Co. has recently been given a contract to furnish butane gas to the town of Ukiah, Calif., for the year beginning next September 9. It is the policy of the city council to distribute its contracts among the various companies operating locally. The Associated Oil Co. is supplying the city's butane needs during the current year.

MOORE'S

COMBINATION RANGES

America's Finest and Most Beautiful

NO BAFFLE PLATE
to handle and take up oven space. This is a patented feature.

OTHER FEATURES—DUAL SPEED. Oven operates equally efficient on either Coal or Gas—simply turn a valve to switch oven from one fuel to the other—Harper die-cast aluminum DOUBLE DUTY speed simmer cooking top burners—Sturdy CAST-IRON construction and many other features which assure complete customer satisfaction.

MOORE'S RANGES are A.G.A. approved for bottled gas.

THE MOORE CORPORATION
Since 1857
JOLIET, ILLINOIS

Oklahoma Regulates Usage of Liquefied Gases

House Bill 616 defining and providing for regulations covering the safe storage, handling and transportation of liquefied petroleum gas, passed the Oklahoma legislature and was approved by Gov. Leon C. Phillips, April 25. It does not carry the emergency clause, therefore will not become effective for 90 days.

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The Complete Line

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The bill passed substantially in the same form as sponsored by committees representing manufacturers and dealers in liquefied petroleum gas and as reported in the April, 1939, issue of *GAS*. The legislation, when effective, will give greater stability to the industry and insure a greater degree of protection for the public against sale and installation of unsafe or sub-standard appliances or equipment.

Another bill, House Bill 489, immediately effective, levies a four per cent excise tax on diesel fuels and liquefied petroleum gas used in motor vehicles operating over public highways of Oklahoma. The tax, however, does not apply to such fuels used in equipment operated by the United States government, or in farm tractors used in agriculture.

Users of these fuels must not only pay the tax but secure a special fuel use license; also comply with certain requirements as to accurate measurement and calibration of the fuel.

■ ■

Louisiana Passes New Law for Liquefied Petroleum Gas Men

Placing the inspection of liquefied petroleum gases under the jurisdiction of the Public Service Commission was approved by the Louisiana legislature in an act which became effective March 1, 1939.

Copies of this act are available from the Public Service Commission at Baton Rouge, La.

The rules follow closely the N. F. P. A. regulations and provide for inspection and penalties for infractions. Manufacturers, jobbers, and retailers installing equipment are required to post satisfactory bond, and fines will be assessed against firms delivering gas into unapproved installations.

■ ■

Butane Service Stations Approved for Sacramento

The city council of Sacramento, Calif., has acted favorably upon an ordinance regulating the storage and installation of plants and filling stations handling butane gas within the city limits and designating truck routes for vehicles using this fuel.

All installations shall be above ground and are restricted to the heavy industrial use zone. The ordinance became effective May 28.

Parker Named Pittsburgh Meter Vice-President

Col. W. F. Rockwell, president of the Pittsburgh Equitable Meter Co., has announced the election of Walter H. Parker as vice-president of the company. Mr. Parker has been manager of the liquid meter division for a number of years. In his new capacity he will have charge of all manufacturing operations in the two Pittsburgh plants as well as the factory in Hopewell, N. J. A graduate of North Carolina State University, Mr. Parker, previous to becoming associated with the meter company in 1929, served as chief engineer for the Fry Equipment Co. of Rochester, Pa.

■ ■

Scaife & Sons Establishes Research Fellowship

Wm. B. Scaife & Sons Co., of Pittsburgh, has established an industrial fellowship in Mellon Institute for the purpose of conducting scientific research on problems pertaining to processes of fabricating and to the use of metal tanks, pressure cylinders, and water-softening equipment, its principal products. This investigational work will be in accordance with the company's desire to keep closely informed regarding all technical progress in its own and related fields.

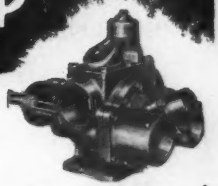
For many years the company has carried on technical studies in its own organization, but the fellowship at Mellon Institute will enable the Scaife scientific staff to benefit by the investigational and cooperative facilities of the Institute. Dr. H. L. Anthony III is the present incumbent of this fellowship on metal-working.

■ ■

W. B. May Opens Propane Gas Station at Lodi

W. B. May has recently established a propane gas supply station on Victor Road, one block east of Cherokee Lane, near the city of Lodi, Calif. Dealer connections extend into Calaveras, Sacramento, El Dorado and San Joaquin counties, all of which will be served from the central station. The organization operates under the name of Mayco Liquid Gas.

New GRANCO BUTANE PUMP



● The GRANCO BUTANE PUMP is more than a regular pump. Specially developed for butane and propane service, it uses the EXCLUSIVE GRANBERG PRINCIPLE — rotary knuckle joint pivoted in housing without dragging or sliding movement. Smooth and quiet in action. UNEQUALLED dry suction.

See These Features

● HOUSING of special iron alloy approved by California Industrial Accident Commission.

● SAFETY VALVE mounted on pump.

● RELIEF VALVE integral with pump, chatterproof and adjustable.

● PACKING GLAND with special lubricating device positively delivering lubricant to and reviving life of packing.

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Magdalena, N. M., Will Use Liquefied Petroleum Gas

The village trustees of Magdalena, N. M., passed an ordinance April 13 extending to the Superior Marketing Co. a 25-year franchise license to establish plants and sell liquefied petroleum gases to the public. Thomas Curran organized the company.

Butane gas will be sold in bottles and through an underground system as soon as it can be established. The sale of natural gas is also permitted under special clauses of the franchise, and it is expected that distribution equipment will cost between $10,000 and $15,000.

It is reported that the Superior Marketing Co. expects to operate in Hot Springs, Socorro and Mountainair as well as in Magdalena.

■ ■

Holicer Gas Co. Advances Janie Byrd, Demonstrator

The Holicer Gas Co., of Mansfield, La., has opened a branch office in Minden, La., according to J. R. Holicer, president, and it will be under the management of Miss Janie Byrd. The selection of Miss Byrd to this position is the direct outgrowth of her successful sales and demonstration work with liquefied petroleum gas appliances for her company. An article telling of her work, written by Mr. Holicer, appears in this issue of BUTANE-PROPANE *News* on page 30.

Murray Cole will be service manager for the Minden office, and Cliff Castleberry is the first of several salesmen to be appointed.

■ ■

A Boon To Campers

No longer will lazy and inexperienced city campers have to hustle wood on their summer outings and fishing expeditions if they will adopt the invention of "Babygaz" (France) of a portable gas stove, operating on butane. Small, simple in design, this little stove can be carried in an automobile. The weight of the stove and gas container is under 5 lbs.; it is made of special steel, with a control cock and burner, and all contained in a sheet metal box. The gas bottle can be recharged by means of a simple, patented device.

Northwest Cities Gas Co. Enters Clarkston, Wn.

The Northwest Cities Gas Co. has built a plant in Clarkston, Wn., to serve that city with butane gas. The new service is a change-over from the water gas heretofore supplied, the system extending throughout the incorporated area. The new equipment and installation cost approximates $7000. The plant was erected by Ransome Co., of Emeryville, Calif., under the supervision of Don York, and service was established shortly after April 15.

The old mains were tested for possible leaks by the use of ethyl mercaptan, and customary alterations were made to air mixers and other gas appliances in anticipation of the use of the liquefied petroleum gas.

The butane gas will be shipped into Lewiston, Idaho, across the Snake river from Clarkston, in railroad tank cars, where it will be stored in a 20,000-gal. tank at the Lewiston plant. From there it will be transported to Clarkston by tank trucks and transferred to a 2500-gal. storage tank there.

■ ■

Liquefied Gas Dealers Organize in Florida

The first formal meeting of the recently organized Florida Liquefied Gas Dealers Association was held in Ocala, Fla., on May 4.

Elected to the presidency was Greg Walsh, of the Vapo-Gas Co., Orlando. Leslie Wade, Ocala Natural Gas Co., Ocala, was selected as vice-president, and the office of secretary-treasurer went to W. R. Wood, of Orlando Butane Service, Inc., Orlando.

Membership invitations have been extended to all Florida liquefied petroleum dealers, and associate memberships to appliance dealers and any others indirectly interested in the welfare and development of the industry in the state.

■ ■

R. M. Wilch is the owner-manager of a new store opened in Columbus, Neb., at 2309 11th St., which will specialize in the sale of appliances adapted to the use of liquefied petroleum gases. Orin McFadden is the Columbus district representative of the Bupane Gas Co., a separate organization.

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Gas Used in Manufacture of Two New Explosives

TWO cheap, powerful high explosives, each as destructive as nitroglycerine, can now be made from natural gas, according to an announcement by the American Chemical Society in Baltimore April 2, on the eve of its 97th meeting. The discovery means, it is stated, that limitless quantities of high explosives can be made from air, natural gas and steam alone.

The discovery of a new chemical synthesis was made at Purdue University. It was reported by Professor Henry B. Hass, head of the University's chemistry department, which had the collaboration of the Hercules Powder Co., Wilmington, Del. This company has already made the explosives.

Methane, which is common "fire damp," or marsh gas, and which is abundant in natural gas, is the source of one explosive. The other comes from ethene, a colorless, odorless gas found in natural gas. Each condenses to a solid when treated with formaldehyde. Nitrogen is then added. This makes a mixture which can be substituted for nitroglycerine.

Nitroglycerine constitutes from 20 to 75 per cent of the bulk of all explosive power. These new natural gas explosives act similarly. Steam is used because it extracts formaldehyde cheaply from natural gas. Air furnishes the nitrogen.

Natural gas dynamite has a high economy value in time of war for it would effect the saving in glycerine which comes from food fats, the supply of which is often drained for the making of high explosives.

■ ■

Wm. B. Scaife & Sons Co. Issues Handy Chart

The Hauck Bottle Gas-Electric Chart for determining the relative operating costs of bottle gas and electricity for cooking is being furnished to the trade by Wm. B. Scaife & Sons Co. of Oakmont, Pa., and copies can be obtained by writing to their headquarters. The chart shows the comparative rates of electricity for 1c to 4c per kwh. and bottle gas from 4c to 12c per lb.

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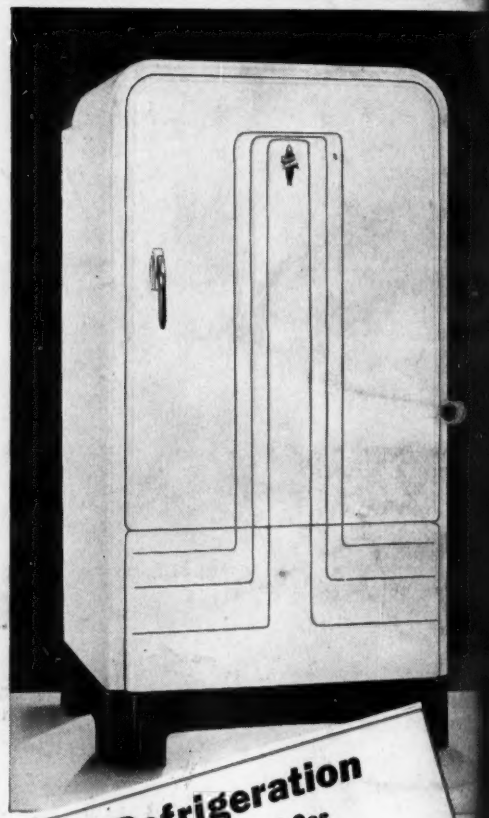

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